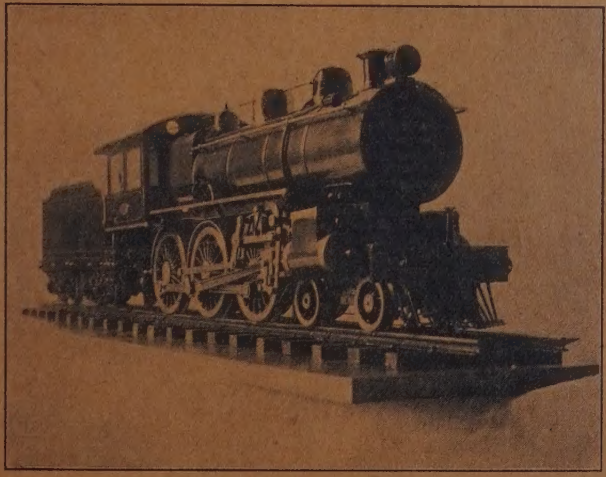
THE MODELMAKER

A. P. Blaney.
Jan - 1930

THE MODELMAKER

FOR THOSE INTERESTED IN MAKING WORKING MODELS

VOL. VI. No. 1 JANUARY, 1929 10¢



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THE MODELMAKER

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OUR FOREWORD

"The Miniature Fair of the Iron Horse," as it was called, was staged in a new building in Greenwich, Conn., and was open for two days, January 5th and 6th.

Mr. Minton Cronkhite has just had a building completed 86 ft. by 36 ft. The whole of the upper floor will be devoted to his ¼" scale Model Railway System.

At present the track will only be temporary, as it will take considerable time to lay out in a permanent manner the installation which will eventually be a very complete one, including electric signals.

He has asked his modelmaker friends who have ¼" scale locomotives and cars to loan them for the Exhibition, as he is anxious to make this first exhibit a comprehensive one. And a number of complete trains with locomotives have been promised.

Mr. Cronkhite has a number of locomotives and cars, P. R. R. type, all ready and others under construction. There will be quite a variety of locomotives and many cars — about 200 pieces of equipment altogether. The system will be electrically operated.

He has been interested in model work for a number of years, and this effort on his part to bring modelmakers together and to increase the interest in this delightful recreation is deserving of commendation, and it is to be hoped that it will be the incentive for a number of similar exhibitions in other places.

There are many readers of The Modelmaker who have complete railway systems already, and others who are developing a complete system, so that with such encouragements as this exhibit will induce, there should be considerable increase in the next few years in this branch of modelmaking.

While Mr. Cronkhite's exhibit will only include ¼" or "O" gauge, there are other complete systems, including 1¼", 2¼", 2½" and 3¼" gauges.

We hope to be able to give fuller particulars of this exhibit in the next number of The Modelmaker.

We also draw our readers' attention to the announcement of the New York Society of Model Engineers' Exhibit in another part of this issue.

THE CONSTRUCTION OF A MODEL GASOLENE ENGINE

By Mr. E. K. LOCKWOOD

(Continued from Vol. 5, page 242)

The Crankcase

The machining of this set of castings will, of course, depend upon the available equipment. It will be assumed that the average reader at least possesses a lathe of about 6" swing with a slide rest, face plate, and a 3-jaw universal chuck, with both inside and outside jaws, drill chucks and a set of drills.

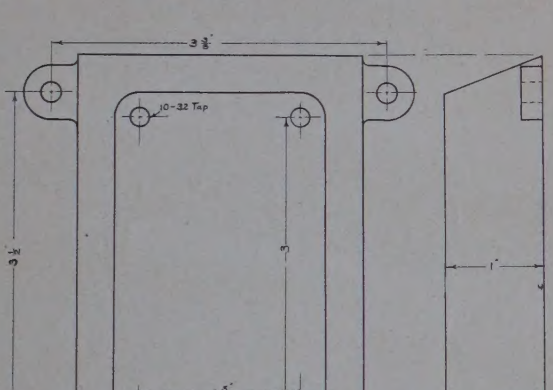
After having received the castings and detail drawings, study the latter and determine the surfaces which are to be machined. These are indicated by the letter "f" against them on the drawings.

Before starting on the machining of any castings, they should be filed so as to remove any lumps or roughness and all traces of sand scratched off.

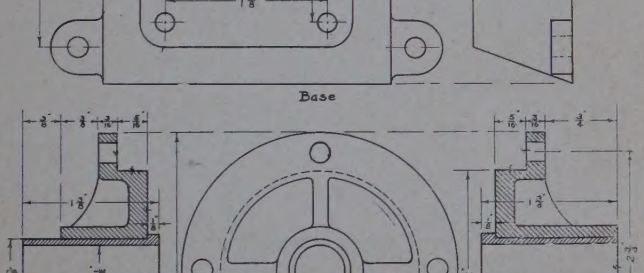
First, take the base casting and file the bottom of same until reasonably flat. The base may now be clamped to the face plate with its bottom toward the plate. We are now ready to machine the top. After this is accomplished, remove casting from lathe and make a template out of a piece of flat steel about 1/16" x 2⅛" x 3½" and mark off bolt holes, according to the drawing, drilling the same with a No. 22 drill, which is tapping size for No. 10-32 screw. Clamp this template to the top of the base and drill and tap the four holes. The template should be marked in some suitable manner so it can be used in the correct position for making the holes in the crankcase casting later. Now take the base and fasten to the face plate with the machined face against the plate and machine off the bottom, remove from the machine, mark off the holes in the four bosses and drill to the required size. The base may now be laid aside.

The next step is to machine the crank case. First chuck the casting, using the inside jaws and inserting them in the cored hole in the top of the casting and then tighten. The bottom of the case should run true. If it does not, it may often be made to do so by trying the chuck jaws in another position. This should be done until the desired results are obtained. This surface may now be machined off, after which it is removed and chucked again. This time the jaws are inserted in one of the cored holes in either end of the casting. More care should be exercised in setting up for the inside is to be bored out as well as the end faced off. With a tool set in the slide rest as a guide, the casting should be shifted until it is certain that when the boring is accomplished that the holes will be concen-

tric with the outside of the casting. Now face off the end, after the hole in the end to a diameter of 2". Now remove the



Base

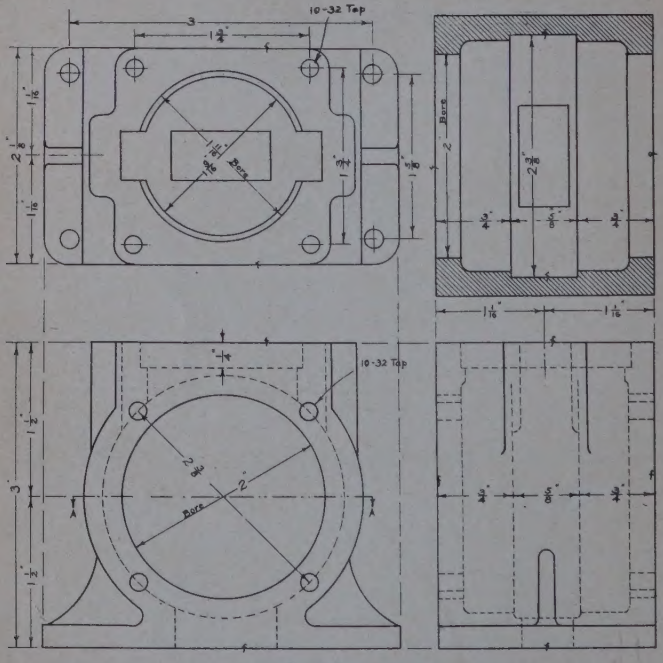


Crank Case Heads

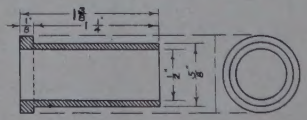
E. K. Lockwood

which the boring tool should be placed in the tool post and the inside bored out, as indicated in the drawing. This done, bore casting and reverse it, so that the hole in the other end may be bored to the same diameter and the end faced off. If this

work has been very carefully done, the ends will be parallel and the end holes in alignment. that the hole in the top may be bored out and be in the exact center of the top face. Now



Crank Case



Crank Shaft Bearing

E. K. Lockwood

Next clamp the casting to the face plate with the bottom face against the plate and center, so bore as required and then face off the top so the distance from the base is exactly 3". Remove

the casting and clamp the template to the bottom in the correct position, drill the four holes, remove the template and drill these same holes out with a No. 9 drill. This casting may now be laid aside.

We now pass to the crank-case heads or covers. Chuck one of these castings by the hub and face off the back, completely machining the horizontal portion until it exactly fits into one end of the crank-case. Before taking the piece out of the chuck, bore out the cored hole to a diameter of 5/8" for the crank-shaft bushing. The piece may now be reversed in the chuck and the facing completed. Now mark off the screw holes and first drill with a No. 22 drill. Place this cover on the proper end of the crank-case and clamp in the proper position. Using the same size drill, drill the four holes in the crank-case and then remove the cover, tap out the holes just drilled, and then the holes in the cover should be drilled out with a No. 9 drill. It is advisable to punch the cover and the crank case so that you will know which end the cover was made to fit. Machine the other cover in the same manner, but be sure that it is made to fit the other end of the case.

Now take the bushing casting and chuck it. Bore this out to the mid-point, so that the hole is about 1/64" under size, and machine as indicated. The bushing should be a forced fit into the head. After the first bushing is machined, reverse the casting in the chuck and machine the other one so that it fits the other head properly. With a parting tool, part the two bushings. After applying a little light oil or white lead to the outside of the bushings, force them into the proper covers.

Assemble the crank-case and run a 1/2" reamer straight through the two bushings. This will cause the main bearings to be in perfect alignment, which, needless to say, is very important.

In the next article I will describe the machining of the crankshaft, flywheel, pulley, timer, and connecting rod, etc.

(To be continued)

A VERY IMPORTANT CORRECTION

In one of our recent issues we stated that Mr. Pontin had purchased a large stock of photos of English locomotives, and famous trains. This was a misunderstanding on our part. We are glad to make the following correction. Mr. Pontin on his recent visit to England took all the negatives himself and the photos he has for sale are made exclusively by his firm from his own negatives. He has nearly four hundred. We have seen some of these photos and they certainly are excellent. A photo album made up from selected views from this collection of authentic old and up-to-date types of English locomotives and trains would make a fine addition to the Model Railway enthusiasts Library. Full particulars and list can be had from Pontin and Wyman.

Mr. George E. Parezo, 2 T Street, N. E., Washington, D. C., is very much interested in model electric locomotive construction, and would like to get in touch with any of our readers located in his district who are interested in this subject.

A NEW ZEALAND MODEL LOCOMOTIVE

The Locomotive shown upon the cover of this issue is from a photograph sent us by a reader of the Modelmaker, Mr. Alfred S. Thomas, 17 Argyle St., Mornington, Dunedin, New Zealand. It certainly looks like a fine piece of work.

Particulars

4—6—0 Passenger Locomotive 2" gauge.
Cylinders 5/8" bore by 1" stroke.
Driving Wheels 2¾" dia.
Bogie Wheels 1¼" dia.
Walschaert Valve Gear.
Length over buffers, 30".
Superheated.
Safety Valve, pop pattern set to 50 lbs. pressure.

He writes as follows:—"I consider The Modelmaker represents excellent value at 4/2 per year.

"I am rather surprised that a contributory page on "Workshop Topics" is not included in your fine paper. However, I shall try and help you next mail.

"You have asked me for items of interest from Modelmakers in my country. Right away I would say that as far as my district goes I am playing a lone hand, and receive very little encouragement. The hobby is looked upon as a 'toy maker's fad.'

"Nevertheless Auckland city boasts and is proud of a Modelmaker Club.

"I am enclosing two photos of Locomotives I have built. For the 4—6—0 Engine I received a gold medal and First order merit diploma at the New Zealand and South Seas Exhibition in 1926.

"The particulars of the other Locomotive is as follows:

4—4—2 Passenger Locomotive, 2" gauge.
Cylinders ½" bore by 3/2" stroke.
Driving Wheels, 2¾".
Bogie Wheels, 1½" dia.
Slip eccentric valve gear.
Superheated.
Safety valve, pop pattern, set at 45 lbs. pressure. One of the photos shows a portion of my small garden railway.

"Concluding I would state that I shall be pleased to correspond with any of your readers who care to write me for mutual help."

Mr. R. H. Marshall, P. O. Box 715, Sanford, Seminole County, Fla., writes us that he has been interested in Model Boat Building for quite a number of years, and would very much like to get in touch with any of our readers, interested in this subject, in his locality with a view to an occasional meeting. He has been gathering for some time illustrations and scattered information about railway heavy artillery guns that were used during the war, but he would specially like to get a blueprint and full dimensions before commencing the construction of a model of one of these guns. If any of our readers can help this gentleman in this matter, we are sure he will appreciate the courtesy very much.

If you have not already sent in your renewal to The Modelmaker for 1929. We would like to hear from you at an early date so that we can bring our subscription list up to date. Please give this your immediate attention.

Have you all the back numbers of The Modelmaker? If not what do you lack?

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 232, Vol. 5.)

Steam and Exhaust Pipes, Lagging, and Guide Bars.

The Steam pipe union consists of a nipple, nut and sleeve which is ultimately connected to steam pipe from superheater by means of a long nut.

To make the nipple chuck a piece of ⅜" round brass face off the end, center, drill 5/32". turn down for ¼" length to ¼" diameter and screw ¼"-40. Thread the ⅜" part 32 threads per inch and cut off with the small cutting off tool 9/16" overall. It is a good practice to slightly chamfer the ends of all screwed work as this tends to eliminate the sharp burr left by the first thread. Make two nipples one for each cylinder. The nut is made of ½" hexagon brass, chuck a piece, face off end center, and drill first ¼" diameter then with a Q letter size drill for 5/16" deep.

Now, square out the bottom of hole with a counterbore made like sketch, Fig. 14, and then tap ⅜"-32 Model Engineer thread to fit on nipple previously made.

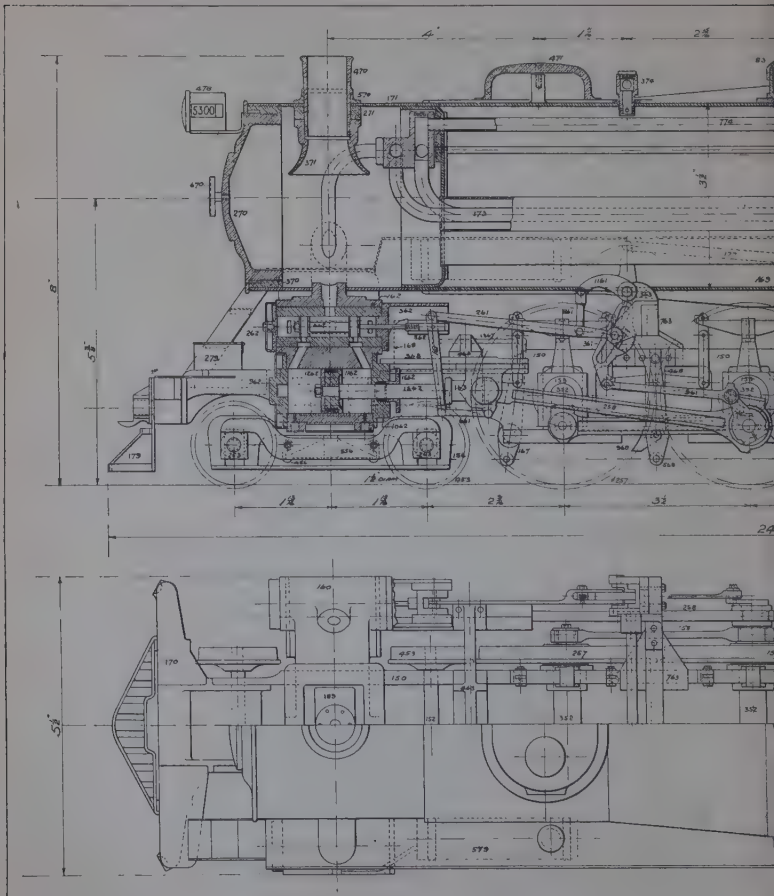
Two sleeves are also required turned from 5/16" round brass. Before cutting off try the nut on to see whether it slips on easily, then cut off, reverse in chuck and take a light facing cut across collar and turn a small V groove in the face, see sketch Fig. 15. This holds the graphite jointing compound to make a steam tight joint.

The steam pipe nipple and lock nut made of ⅜" hexagon brass need no further comment.

The Exhaust pipe consists of a cast base and screwed tip. Hold the round end in chuck, and face off the flanged base. Then clip onto faceplate by the flange, locate till top part is running true face off to 13/16" high, center, drill Q and tap ⅜"-32. Next make a square end tool 1/16" wide with ample side clearance, see Fig. 16, and turn the blower annular groove ⅛" deep. Having accomplished this, place the casting on its side on tool slide of slide rest and pack up to lathe centers, swing slide around to 30 degrees and end mill the exhaust passages to open into the ⅜" tapped top.

The exhaust tip is turned out of ¾" round brass drilled 5/32" and turned ⅜"-32 to screw into base. A deep flange is thus formed, which when drilled with 6 No. 60 holes come right over the groove in base. Drilling the feet of base for two No. 2-56 brass screws and the little boss on front to receive a 1/16" steam pipe, completes the exhaust pipe.

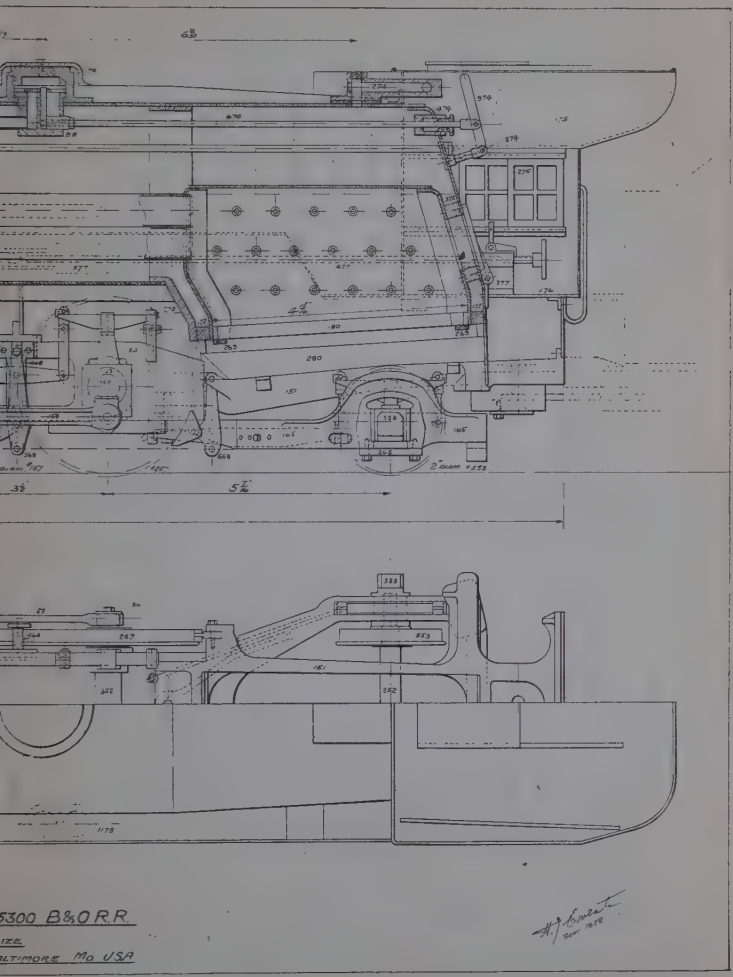
Guide bars are made from 5/16" square cold rolled steel.



MODEL PRESIDENT WASHINGT

½ INCH SCALE – DRAWIN

DESIGNED BY H.J. COVENT


6⅝"
4⅝"
2" diam.
33"
5⅞"
5300 B&O R.R.
IZE.
LTIMORE Md USA

Probably the easiest way is to have some reliable machine shop mill a six inch length of steel to the proper section, see Figure 17, then cut in two pieces. Tin the edges marked A, clamp the two together with a neatly fitting piece of material

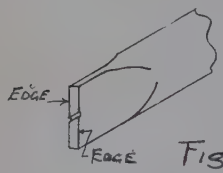


Fig 14

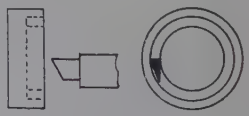


Fig 16

Fig 15

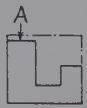


Fig 17

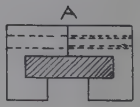


Fig 18

3/32" x 5/16" between and heat till the solder melts—Fig. 18. Mark out the bolt holes, drill one No. 52 tap the other 0.80. Finish up the bars with a file to the drawing, but do not fit them to the cylinder heads yet. The exhaust pipe however can be fitted and screwed in place and the cylinder lagging of 26 G sheet brass attached with two 0.80 screws top and bottom.

Note that the drawings you will receive contain parts that are not mentioned in the particular section. This is not an oversight, but such parts are not to be made yet. They will be dealt with in due time and order.

Next month instructions will be given for frames cradle casting and bumper.

(To be continued).

Mr. Charles Purinton, 251 Pleasant Street, Marblehead, Mass., sends us his subscription for The Modelmaker, and makes the following comment: "I think the articles now running in The Modelmaker by Mr. H. J. Coventry are fine, and his method of sending castings, etc., and then giving the modus operandi in The Modelmaker is a master stroke, and should gain a good many converts to model-making."

PACIFIC TYPE LOCOMOTIVE

1¾ inch Gauge

By Mr. L. LAWRENCE L.B.S.C.

This locomotive was built for Mr. J. T. Lozier, and is now in New York City.

Particulars

Truck wheels 1⅛".
Drivers 2½".
Trailers 1 7/16".
Cylinders 9/16" bore, ⅞" stroke.

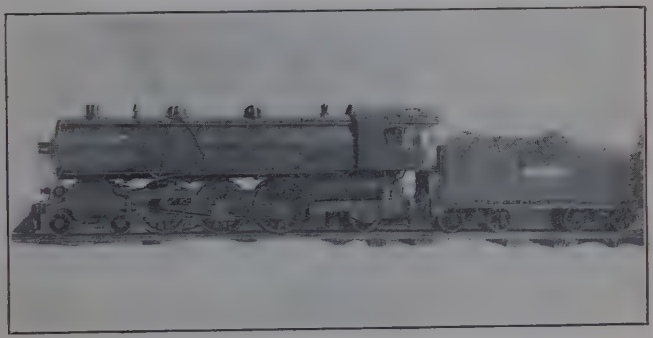
Valve gear, full Walschaerts, providing for lap and lead, cutting off at 75% in full gear; will run notched up as on full-sized engine.

Boiler, alcohol fired water-tube type, as specially requested by Mr. Lozier on account of indoor operation. Will maintain 75 lb. pressure under all conditions of working. Superheater, blower, gauges and all fittings.

Boiler feed by eccentric-driven pump ¼" x ¼" situated between frames. Hand pump in tender as stand-by. Both feeds pass through heating coils in the casing between check valves and inner boiler barrel. Removable disc throttle with internal collecting pipe. Fittings can be seen in the photo.

Tender-wheels 1¼" diam.; cast truck frames; body of sheet brass, containing alcohol and water tanks.

Test. The engine was tested by Mr. Lozier before he accepted delivery. With 40 lb. only on the gauge it started, from a dead standstill, the builder who weighs 168 lbs., sitting on a 2½" gauge 8 wheeled flat car. Mr. Singer of New York also acted as negineer and was pulled along without trouble. Mr. J. T. Lozier who weighs nearly 230 lbs. then took the throttle; the steam pressure had now risen to 70 lb. and when the throttle was opened, the wheels slipped a little but the locomotive got away with this comparatively enormous load and puffed merrily along the track with no loss of steam pressure. Mr. Lozier amused everyone by remarking that he could not believe that the little ⅜" scale locomotive on a track only 1¾" wide was hauling him entirely by its own power.



NEW YORK SOCIETY OF MODEL ENGINEERS

The Society is holding its first Annual Exhibition from January 22nd to January 26th, inclusive. It will be held in the Bush Terminal Office Building, 130 West 42nd Street, New York City. The hours will be from 1 to 10 P. M., daily. The Society extends an open invitation to all model enthusiasts to come early and stay late. This will be the first exhibition of its kind to be held in the vicinity of New York.

In the model railway section there will be models of locomotives, steam, electric, rolling stock, passenger and freight, track sections, switches, crossovers and signal system, etc. They vary from ⅝-inch to 2½-inch gauges.

There will be a section devoted to marine and stationary engines. This will include three of the latest successful gasoline engines under 1½-inch bore and stroke and 3½-inch Parson type steam turbine. Another section will contain the marine exhibit, consisting of speed boats and sail models of various types and periods

The Society's latest acquisition, the aeronautical division, will be represented with a large assortment of flying and scale models, both military and commercial.

This Exhibition is being given to promote interest in models and model making. The Exhibit will represent the latest and best developments in model engineering. This, coupled with the wide scope of exhibits, will provide something of interest for every visitor, irrespective of what branch he is most interested in.

There will be no admission charge, and the Society cordially welcomes visiting model makers, for whose benefit a visitors' book will be kept.

The regular meeting of the Society was held on December the 18th.

A tentative outline of the Exhibition was given and all members were asked to give their full co-operation.

A financial statement was read.

Mr. Grimke gave an illustrated lecture on the Slide Valve.

Messrs. Bauer, Alexander, Claudius and Heimberger entered models in the Workmanship Contest.

Messrs. Zimmer, Cotillieard and Johnson acted as judges. The reward was given to Mr. Heimberger for his Two-Cylinder Marine Type Engine.

Three visitors joined. Thirty-seven members were present.

We extend a cordial invitation to all modelmakers visiting New York to attend any of our meetings.

There will be no regular meeting of the Society for the month of January.

For information and application blanks, apply to Mr. F. D. Grimke, 21 East 87th Street, New York, N. Y. Mr. Grimke can only be seen by appointment. Telephone Number Sacramento 9389.

The future meetings of the Society for 1929 are as follows: February 26th. March 26th. April 23rd. May 28th. June 25th. September 24th. October 22nd. November 26th. December 17th. All are the fourth Tuesday of the month, except December 17th, which is the 3rd. These dates are subject to change without notice.

The Editor,
The Modelmaker.
Dear Sir:

Some few customers building my B. & O. Model ask for tapping size of drain cocks on cylinders. This has purposely been omitted, so that holes can be tapped to suit any drain cocks the builder may have or purchase.

However, so many have expressed a desire to make these that I have added a detail drawing to the set. This will come with the rest of valves and boiler fittings later on. In the meantime the cylinders should be tapped No. 8-36.

The large number of patrons of B. & O. No. 5300 enables me to obtain all special material, tools and screws, etc., at reasonable prices. For their benefit I will shortly have a stock of special M. E. standard taps and dies, and No. 0-80 and No. 2-56 hexagon head screws.

The castings and materials I am supplying under my sectional scheme are complete, there will be no other material, casting, part or even boiler fitting to buy as these in rough form are included, excepting pressure gauge and screws. As I have said, these can be obtained at fair prices later.

I would ask my many friends, particularly those whose experience is limited, not to get discouraged if a job seems difficult, or goes wrong. One remedy is to use a letter addressed to me for advice, and then try again. I am particularly desirous of having the satisfaction of knowing that there will be in the future months 100 per cent engines in running order for every set of materials I ship.

Cordially yours,
H. J. COVENTRY.

Mr. C. A. Cunningham, 212 E Street, S. W., Auburn, Washington, sends us a photograph of his locomotive and train. The locomotive is a model of No. 2258 Q—6's which pulls the North Coast Limited on the Seattle branch of the Northern Pacific R. R. The train consists of two box cars, a flat car, cattle car and caboose. From the photograph it certainly looks like a nice piece of work. He writes: "I am just finishing a five-car passenger train, all steel, consisting of mail car, baggage car, day coach, pullman car and observation car. Each car is 28" long, illuminated with electric lights. The gauge is 2¼". He says he recently met Mr. Frederic Shaw, of Tacoma, and they had a grand time together talking models. He is a locomotive fireman and has been connected with the railroad for sixteen years, so we feel sure he knows his subject thoroughly. He would very much like to get in touch with any of our readers in his district interested in model railway work with a view to an occasional meeting for mutual benefit.

We have just received three very nice photographs from the Customs Built Toy Co., one a finished flat car. Another view shows the flat car framing with trucks, but without the flooring, and the third a complete set of a Bettendorf freight truck. These photographs give a very clear idea of this line of half-inch scale goods this firm is putting on the market. Copies of these photographs can be obtained for a nominal fee of 5 cents each.

When writing to advertisers please mention The Modelmaker.

A NEW SOCIETY

The New Rochelle High School Model Engineering Society has been organized with fifteen members. Mr. Arthur Meggett was elected President; Mr. Robert Ward, Vice-President; and Mr. George Jarvis, Secretary-Treasurer. Meetings are held every alternate Thursday. Mr. E. P. Alexander gave his valued services in helping to form and launch this new organization.

Their Aims: To promote interest and further development of scientific model making as a recreation, especially Model Railway Engineering, Model Power and Sail Boats, Model Airplanes, Model Stationary, Steam and Gas Engine practice and work appertaining thereto.

This is certainly an organization that should not only be actively supported by all the youths eligible, but especially so by the parents of the members by their encouragement and by suitable donations of prizes for competition in the various classes of modelmaking. A few kindly words of encouragement and appreciation means an awful lot to a young novice in the midst of his perplexities over building his first model.

Buy the youngster a few real good tools or perhaps a lathe, and take a real interest in the work he is trying to accomplish, encourage him to put his very best, his heart and soul into the work, and perhaps some day that son, or younger brother, may develop from a sprouting young modelmaker into an engineer who in time will take his place in the front ranks of one of the noblest professions the world has ever known.

We wish this new organization good luck, and may the New Year be a successful one to all of them.

One of our American readers who recently paid a visit to Sydney, New South Wales, had the pleasure of being present at a meeting of the Sydney Society of Model Engineers, where he saw some very fine Models. Also some very interesting tests of an electric locomotive attached to a steam locomotive in a tug-of-war. He did not mention the result, but said they were a fine lot of fellows who certainly understood what good Modelmaking was. We should like to hear more from our Sydney friends, so hope that this short note will attract the eye of some Sydney reader and that he will shoot us over some stuff (a complete file of The Modelmaker will be found in The Public Library, Bent Street, Sydney, N. S. W.). The writer lived for nearly four years in N. S. W. before he came to this great country, and he always feels he left a piece of his heart in the "Land of the Golden Fleece." He often wonders what has become of Harry Press's (Woolloomooloo Bay) fine fleet of half deckers "The Port Jackson Sailing Club," and Mark Foy's Club "The Flying Squad." He was a member of both Clubs and sailed from Press's Shed. We have been the American Agents for the Model Engineer since 1898, and no doubt our name which is at the top of the front cover page may be quite familiar to many Sydney readers of that famous Journal. Subscriptions for The Modelmaker can be placed with Gordon and Gotch.

Have you sent us the renewal of your subscription? Please let us have it at an early date.

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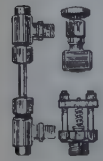

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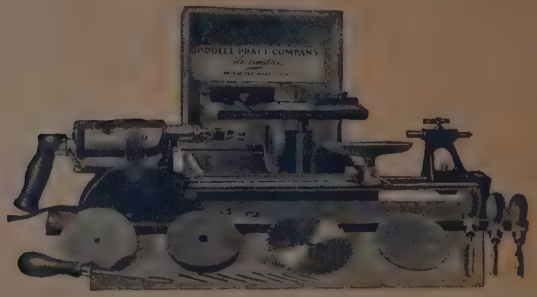

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THE MODELMAKER

Published by SPON & CHAMBERLAIN

120-122 LIBERTY ST., NEW YORK, N. Y.

Editor—W. Edmunds Spon

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OUR FOREWORD

The Finance Plan in Modelmaking as initiated by The Modelmaker is proving a great success.

The fact that the whole scheme of work is carefully planned out in a definite number of operations, each operation fully described and illustrated, and that all the material for each operation, can be purchased as required, for a nominal sum, seems to appeal to our Readers.

The B. & O. "President Washington" locomotive Model has made a big hit with model locotive fans. The castings are high grade, the scale drawings most comprehensive, and Mr. Coventry not only supplies all the materials to the smallest screw and necessary taps and dies, but will also answer any letters from men who are building this Model, and do all he can to help each and everyone make a fine operative locomotive.

Mr. Lockwood's Model Gasoline Engine is on a similar plan and this is also going well. Here again is a well designed Model, with fine clean castings and complete set of working drawings.

We realize that there are still a number of our readers that these two projects will not appeal to. We, therefore, ask them to write to us regarding the particular type of Model they would be interested in building, and the purposes for which they wish to use it.

Then we will go into the matter more fully and endeavor to arrange with one of our advertisers to make the castings, materials and drawings, and supply us with the descriptive matter necessary.

We have in mind a 2 in. scale Model of a Marine Walking Beam Engine for a side wheel ferry boat, from the working drawings of one of these Engines, built by a well known firm of Marine Engineers. What do our readers say?

Or perhaps a Stationary Steam Engine, and boiler plant would be attractive.

Going back to Model Railway Work a series of articles on the construction of passenger or freight cars might be attractive.

Readers open up and let us have your views.

Have you sent us the renewal of your subscription? Please let us have it at an early date.

CHICAGO SOCIETY OF MODEL ENGINEERS

At the first regular meeting of the Chicago Society of Model Engineers held January 10, 1929 the annual election of officers took place and the following were selected to serve for the ensuing year:

Chairman—Hubert Beddoes, 4241 Ravenswood Ave., Chicago, Ills.

Secretary—S. C. Swanson, 7826 Coles Ave., Chicago, Ills.

Treasurer—C. J. Musser, 7743 Phillips Ave., Chicago, Ills.

Cashier—Winn V. Kommer, 1017 So. Clinton Ave., Oak Park, Ills.

Vice-Chairman—Andrew Willard, 905 Linden Ave., Wilmette, Ills.

Chairman of Exhibit. Comm.—E. L. Hayward, 3520 Sheridan Road, Chicago, Ills.

The above also serve as trustees of the Society.

The following is a schedule of the meetings for the Society for 1929: The 2nd and 4th Thursday Evenings of every month at 8 P. M. Location Room, 921 Kimball Hall, Wabash Ave. at Jackson Blvd., Chicago, Ill. Modelmakers visiting Chicago should drop in and get acquainted with us.

Mr. Pontin writes us that he is astonished by the number of letters he has received regarding his photos of locomotives and trains. These come from all parts of the United States. He has a new list of railway photographs just ready giving a great assortment of Englisn postcards. He will be glad to hear from any of our readers.

The Editor,
The Modelmaker,

Dear Sir:

There seems to be some confusion in the minds of some model makers about the different type locomotives. I have seen things such as this in various model publications—4—4—0 pacific type, 4—8—2 pacific type, 2—8—8—2 mogul type.

Following is a list of wheel arrangements and the names given to them, copied from "Baldwin Locomotive Data."

4—2—2 Bicycle type.
4—4—0 American type.
4—6—0 Ten Wheeled type.
4—8—0 Twelve Wheeled type.
4—4—2 Atlantic type.
4—6—2 Pacific type.
4—8—2 Mountain type.
2—6—0 Mogul type.
2—8—0 Consolidation type.
2—10—0 Decapod type.
2—6—2 Prairie type.
2—8—2 Mikado type.
2—10—2 Sante Fe type.
4—6—4 Hudson type.
0—4—0 four coupled switcher.
0—6—0 six coupled switcher.
0—8—0 eight coupled switcher.
0—10—0 ten coupled switcher.
Mallet Articulated, 0—6—6—0, 0—8—8—0, 2—6—6—0, 2—8—8—0, 4—4—6—2, 2—6—8—0, 2—6—6—2, 2—8—8—2, 2—10—10—2, 2—8—8—8—2, 2—8—8—8—4.

There are many other wheel arrangements that have not been given a name, while others have been given several names, but these are not common types. Hoping that this will be of some interest to you, I am,

Sincerely yours,
CHAS. G. SCOTT, Jr.
424 E. Walnut Lane,
Germantown, Phila., Pa.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 12)

Frames

There are two ways of making frames: (a) Cutting from cold rolled steel bar, or (b) filing up a cast brass frame. Both methods have advantages and disadvantages. Advantages of using steel are strength, true flat and even thickness to start with. Disadvantages, labor and time required to cut out openings.

Advantages of castings, openings may be cast in saving considerable labor and time. Disadvantages ,castings have to be filed up on inner and outer faces taking time and labor, although not as much as the steel. Weaker than the steel and more susceptible to bending if roughly handled.

The drawing supplied will cover either material and castings will be offered, leaving the builder the option of using other material.

Steel Frames

Take two pieces of cold rolled steel 1½ in. wide ¼ in. thick and 15-11/16 in. long. This material is straight and true to size. Clean off any dirt or grease with emery cloth, take one of the pieces and brush or sponge over one side with a solution of copper sulphate, this copper plates the steel and makes the marking out easily seen. Be careful not to get any of the solution on your tools and see that the job is dry before you use the tools. Now take the "odd leg" or hermaphrodite calipers and set to ⅞ in. Place the hooked leg against one edge and scribe the axle center line from front driver to extreme rear. Next pull the leg in 3/32 in. or 25/32 in. from edge, which will be known as the 'top rail" —Fig. 19. (Throughout these notes, the same terminology will be used as is used in full size locomotive engineering.) Scribe this latter line for about 5 inches. This is the cylinder center line, and as is common practice is placed above the axle center line. Now square off the first or leading driver center 6¾ inches from front end. Prick punch the intersection of the two lines, set the dividers carefully to 3½ in. and step off the other two centers. Check the distance between first and last center. It should be 7 in. exactly.

Set the dividers again to 4⅜ in. and from first or leading axle center line step off the distance, to cut the cylinder center line. Now we have the main points from which all other dimensions are taken, and with the square, dividers, odd leg calipers and rule, mark out the openings between top and bottom rails, contour at cylinder end and screw holes. Take the other piece of steel and lay both together top rail edges down on a surface plate or other flat surface, and clamp the two together firmly either with two small tool makers vises or C cramps. See that the two edges are evenly together, laying a square across

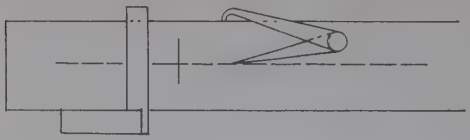


Fig 19

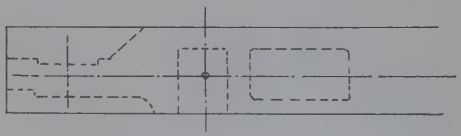


Fig 20

Fig 21

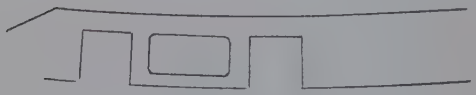


Fig 22

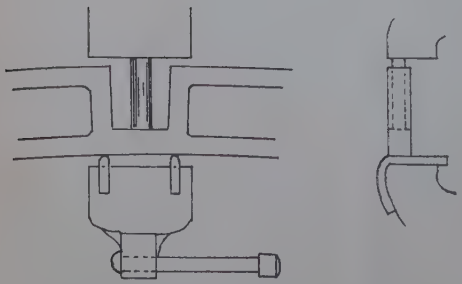


Fig 23

Fig 24

will soon indicate this, and then drill say an ⅛ in. hole right through both steels on the three axle center lines. Countersink each side not more than 1/32 in. and rivet the two together with a snug fitting piece of ⅛ in. soft steel. File off flush and restore the center lines and prick punch, remove the cramps. Now the contour must be drilled around. It is best to mark off another line, 1/16 in. away from your previous marking and center punch for holes close together. A spacing punch is useful which has two points to it one spring controlled which is adjustable, and placed in the previous punch mark the other being tapped with the hammer to make the new space. Use say a No. 35 drill and drill all round outline and openings, leave 1/32 in. metal to be filed away later around the "pedestals" or axle bearing openings. A hack saw will now quickly remove the superfluous metal around cylinder end also pedestals. Removal of the metal from pedestals will of course separate the two frames, but as we have a number of holes already drilled together it is an easy matter to line the two frames together again by putting in pins of No. 44 drill rod. A jewellers saw will be found very useful for sawing between holes drilled around the "between rail" openings. We now have two roughed out frames, and it will not require any indicator to see that the top rail is no longer straight. It will have a decided bend in it. This is due to internal stresses in the metal set up by the cold rolling process, being released on one side by the removal of pedestal openings.

It is not difficult to eliminate this. Take two pieces of round brass or copper and bend them over one vise jaw, place the frame in the vise with top rail against the coppers and another stout piece of brass between the other jaw and the top of pedestal. Screw up gently, just a little at first. You will feel the frame spring and perhaps go back to its bent form. Try again with a little more force. Proceed with the other pedestal openings the same, with a little patience and good judgment you can bring the frame back to almost its original rectitude. (Fig. 23) If you lay a straight edge along the top rail, you will probably have an effect like sketch Fig. 24, very much exaggerated of course. Touch the high spots down with a file. and now from this new straight top rail mark off the pedestal openings for finality. Remember we left 1/32 in. on in anticipation of this distortion. Remove these markings, mark out again and file to the line both frames being pinned together as described above.

It is as well to check the cylinder end of frame for straightness with main center line. Lay the straight edge along the top rail. Its end should be parallel with cylinder center line. From this stage it is a question of file and "elbow" work. A 14 inch rough or bastard file is the one to use for removing the greater part of the metal finishing with a 10" second cut, filing close to the lines and keeping both frames together throughout. Test for squareness along the cylinder seating and rail, and faces of pedestals, frequently. Next job is to reduce the front

end to ⅛ in. thick. A piece can be sawn out and then finish with the file. Do this to outsides of each. If you keep the frames together you cannot make a mistake. Now counterbore holes, that require this. These are shown on drawing outside of each frame. Square off the center lines of cylinder and axles across the top edges of frame and score plainly. These lines will be useful when we come to the erection. Take the frames, apart and mark out for the 1/16 in. recess on inside of rear end, which must be milled out by bolting the frame vertically to the tool post with suitable packing under in a similar manner to that adapted for valve bushes. Work carefully to the lines, get the frame square with lathe bed, take light cut and feed, using lard oil or solution of soap and soda, and with a little of the chief ingredient of good model making patience—you will have a job that could hardly be excelled by a milling machine. Clean off burrs with a fine file and the frames are finished. It only remains to make the binders of ¼ in. square cold rolled steel, hold to frames with a C cramp and drill and tap frames for No. 2-56 screws.

If a cast brass frame is used, the openings and contour are already formed except pedestal openings which must be cut out.

First file up the frame to an even thickness of ¼ in, and file the top rail straight and square. If the castings are bent or out of shape, no fear need be had of hammering or bending flat and straight, good red brass will stand a considerable amount of this treatment.

Cut out the pedestal openings allowing a liberal amount to file. Then file the top rail straight and square, and proceed exactly the same way as for steel frame. For roughing out use 8 in. or 10 in. second cut hand files and finish with 8 in. smooth hand or 8 in. No. 2 American Swiss pillar file. A 6 in. No. 2 Narrow Pillar file is useful for producing sharp corners. To the uninitiated the following note may be of assistance although filing being an art there is no royal road to its acquirement.

The bench and vise should be firm. It is a mistake to imagine any small cheap vise is good enough for small work. A regular machinists vise with 3½ in. jaws will be found best for all round small work. If fitted with swivel base and ground smooth jaws, so much the better although this adds to cost. The height of vise should be such that when you stand erect with your right forearm bent up to the shoulder, your elbow just touches the top of vise jaws. If your vise jaws are truly parallel (and they should be), it will be found a very light pressure on the end of handle is all that is necessary to hold securely almost any job you are likely to get in model work.

Always have the surface to be filed as level as possible in the vise. Stand a little to the left of the vise with left foot pointing forward and right foot slightly behind and at 45 degrees to it. (Fig. 25) See that the file handle is firm on the file tang, grasp handle so that end bears in palm, thumb extended lying on top and forefinger extended along side. Swing the file with the arms only (keeping the body as still as possible), throughout the

whole length of the file, but avoid hitting the vise or work with the file handle. If you do, there is a likelihood of handle being knocked off, the end of file instantly drops, the tang flies upward, the workman's head and shoulders drop forward and conditions are ripe for a serious injury to face or eyes.

Next month the rear frame cradle and bumper will be taken.

(To be continued)

MODEL LAKE STEAMER

By Mr. Jack Lewis

The front cover of this issue shows a picture of a Lake combination passenger and freight steamer. The hull was made from a solid piece of cedar, dug out and then gouged down to a skin thickness of ½ in.

The fo'castle Midship sections of decks, cabins, bridge and wheel house and poop deck are built-up. On the upper deck are four boats. Foremast has a cargo boom and a wireless antenae is strung between the two masts. It has a single screw, but the power plant has not been installed.

Length overall—29 in.
Beam, midship—7 in.
Depth of hull—8 in.
Draft—5 in.

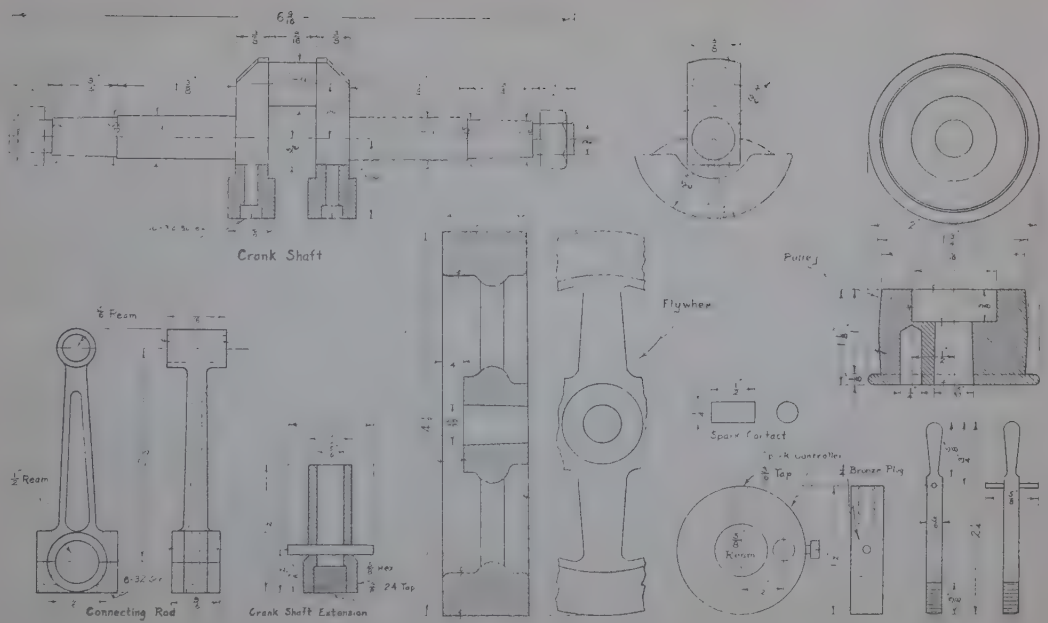
The Ventilators are of brass. The rims to the port holes are shoe eyelets, riveted down on the inside.

Mr. David Clark, 1204 Ohio Avenue, Wichita Falls, Texas, is interested in Modelmaking, and would like to get in touch with any of our readers located in his district, with a view to an occasional meeting for mutual profit.

Mr. Thomas C. Tenniswood informs us that through the courtesy of Mr. F. X. Milholland, the Assistant to the Senior Vice-President of the B. & O. Railroad, he has secured the use of the film, showing the procession of the Pageant given at the Fair of the Iron Horse at Halethorpe, Baltimore, Maryland, at the B. & O. R. R. Centennial, November, 1928. This film will be shown at the next meeting of the New York Society of Model Engineers, February 26, 1929, at Engineering Societies Building, 29 West 39th Street, New York, N. Y. Souvenirs of the Pageant will also be distributed. Any Modelmakers visiting New York will be cordially welcomed.

Mr. Geo. Barker who is now associated with F. W. Icken has had considerable experience in the Engineering line. He was with Vickers, Ltd. for over seventeen years in their measuring instrument division, and then with General Motors in their Service department. The knowledge gained with the above firms, will now be applied to the production of scale models, and will assure the customer of receiving the best possible in design and workmanship.

Mr. A. Megget, Jr., 2a Beaufort Gardens, New Rochelle, N. Y. is interested in "O" gauge and has a very nice electric locomotive, C. M. & St. P. P. R. R. He would like to get in touch with some of our readers who would be willing to give him information of the methods and practice used in the working of this great Railway system.


Crank Shaft
Flywher
Pulley
Spark Contact
Connecting Rod
Crank Shaft Extension
Ream
Brass Plug
Rivet
Tap

THE CONSTRUCTION OF A MODEL GASOLINE ENGINE

By Mr. E. K. LOCKWOOD

(Continued from page 7)

The next job is to make a crankshaft. Take the piece of steel supplied and prepare to lay out the shaft upon it. Some use powdered chalk and water and paint the material and allow to dry so as to make the scribed lines show up well. Since this will rub off very easily so I would suggest using a little copper sulphate in the same way. When dry, it leaves a thin copper plating on the steel on which the lines will show up very well and yet it cannot be rubbed off.

Place the bar lengthwise and on edge on a surface plate (a piece of plate glass would serve the purpose quite well) and with a surface gauge mark a line (A) across each end 11/32 in. from the bottom, after which mark another line (B) across the ends 31/32 in. from the bottom. Place the bar on its side and scribe a line (C) along each end 5/16 in. from the plate. The intersections of the lines marked out locate the centers of the crank pin and shaft. (B and A respectively). Now scribe the line D equally distant from each end and on either side of same mark off the lines E and F each being 9/32 in. from D using a square. These last two lines should be marked off all around the bar. Scribe the lines G & H in the same manner, G being ⅝ in. from E and H being the same distance from F. Next place the bar on edge the way you had it originally and scribe J 17/32 in. up and also the lines K ¾ in. from the plate. The last two lines marked off are the center lines for the holes shown in Fig. 1 which should be made with about a No. 2 drill. Now center punch for the holes and drill after which saw as shown.

The excess material is now pretty well removed and after drilling the center holes in the ends of the bar, a lathe dog may now be clamped to the piece and placed in the lathe for turning. Turn the crank pin first using the centers B. After this has been accomplished, turn the shaft between centers A being careful not to set the lathe centers too tight for you will be apt to spring the shaft. Take light cuts. When the shaft is nearly to size, remove from the lathe and mark off for the holes in the bottom of the crank webs and then drill and tap for a 10-32 screw. Now take the counter weights and file them so that they will just fit on the webs as shown in the drawing. Drill and counter bore the weights for a 10-32 screw and then fasten them to the shaft. They may now be machined on the ends and faces. Now cut the pieces off the ends of the shaft along the lines L as shown in Fig. 1 and finish turning the shaft which should be made a close fit

into the bearings in the crank case heads. The ends of the shaft may now be threaded with a die.

We now pass to the flywheel. Using the inside jaws clamp the casting with front of it against the chuck. Face off the back to the proper amount and its face until reduced to the required diameter. Next spot the center and then drill out to about ⅜ in. after which the compound rest should be set for the correct taper which is approximately 1½° and a boring tool set in the tool post. Bore out the hole until the wheel fits the crank

holes located, drilled and tapped as required. The bronze plug shown in the drawing should be inserted in the disc and the spark controller is finished.

The spark controller handle should now be made. Clamp the piece of 3/16 in. brass rod in the chuck and square off the end. The end may now be shaped up with a file or turned if desired. Remove from the chuck and drill hole for the cross pin after which the pin should be driven thru and finished as shown. After threading the end, it may be screwed into the hole in the spark controller already made.

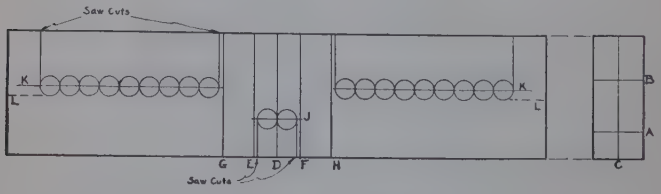


Fig 1

shaft. The casting may now be reversed in the chuck, or better still on a tapered mandrel, and the machining completed after which it may be polished.

The pulley casting should be done in the same manner. The face of the pulley may be turned flat and later crowned by using a file or it may be turned with crown by setting the slide rest at the correct angle.

Now mount the piece of fiber in the chuck and face off one end, spot the center and drill and bore the hole to ⅝ in. diameter. Reverse in the chuck and face off the other end so that the disc is ⅜ in. thick. It should now be removed and the

The crank shaft extension should now be made. The piece of ⅝ in. hexagonal brass rod should be chucked and the end squared off and turned to a diameter of ½ in. for a distance of 1⅛ in. Locate the center and drill a 5/16 in. hole clear thru after which reverse in the chuck and face off the other end making the overall length 1½ in. and tap as required. The piece should be taken out of the chuck and the hole drilled for the crank pin. After the pin has been forced into place and finished off, the shaft extension may be laid aside.

The next task is to finish the connecting rod casting. First

mark off for the machine screw holes in the big end punch and drill thru with a No. 35 drill. The big end may now be split with a hack saw after which the rough surfaces caused by the sawing should be filed flat and true so that the two pieces fit together properly. Tap the holes in the connecting rod with a 6-32 tap and open out the holes in the cap to allow the 6-32 screws to slip thru or in other words drill out with a No. 29 drill. After this has been accomplished, counterbore for the screw heads as shown. Fasten the two parts together securely and chuck the casting in the lathe gripping it by the big end, or better still clamp to a face plate and center the big end. Now face off the end and bore out the hole for the crank pin slightly undersize and finish with a ½ in. reamer. The rod should be reversed and the end machined off so that the rod is 9/16 in. across at the big end as shown. Now locate the wrist pin hole and drill and ream to 5/16 in. Finish with a file where necessary.

I have not explained how to mark out to any extent and anyone who would care to get a very good little book on the subject and one which covers the subject thoroughly, they may get it from Messrs. Spon & Chamberlain. It is entitled "Marking Out" by Twelvetrees and costs but 35 cents.

In the next issue I will describe the finishing of the cylinder, cylinder sleeve, piston and manifold.

(To be continued)

MODEL ELECTRIC RAILWAY MOTORS

Mr. F. W. Icken announces two sizes of a special electric motor for model traction purposes. It is intended for model locomotives of the "O" gauge size and for electric passenger cars of both "O" and ½ in. scale. The small motor is wound for 6 volts D. C. and the large one for 12 volts D. C.

The general specifications (except for actual size) are the same for both motors. The motor has a laminated field and armature, and can be used for either A. C. or D. C. It has a seven pole armature, heavy copper commutator, Copper-Carbon brushes. Bronze bearings, ground steel shaft. The motors turn over at about 2,000 R. P. M. and are extremely quiet running.

Motors can be supplied mounted in a chassis or separately.

Mr. George Teeters, R. R. 1, Harrison, Ohio, has been interested for some time in the construction of Model Airplanes, and has also built a Model of the Santa Maria. He is also getting interested in Model Locomotive Steam Engines, and would very much like to get in touch, with anyone in his neighborhood interested in Modelmaking, with a view to an occasional meeting for mutual benefit.

Mr. Lockwood reports he has received some good returns for his Gas Engine and expects to hear from a good many more of our readers before he completes his series of articles on the Construction of a Model Gasoline Engine. This engine is suitable for stationary work or as the power unit for a model speed boat.

ANNUAL EXHIBITION OF MODELS

NEW YORK SOCIETY OF MODEL ENGINEERS

Chairman—MR. WALTER ELLIOTT
Secretary—MR. F. DRAYTON GRIMKE

This exhibition was held in the Bush Building, 130 W. 42nd Street, New York City, from January 21st to the 26th inclusive and was attended by the members and hundreds of their friends and visitors, some of whom had come from considerable distances to see the Exhibit.

The Chairman and his Committee had worked hard to make this Exhibit a good one.

The arrangements of the stands and the Models was very effective. None of the exhibits were crowded and each item was easy to examine.

The predominating element was model locomotives, rolling stock, equipment, track and signals, and it certainly included some very fine examples of scale and operative models.

The exhibits in the other classes were all worthy of close examination.

The Committee and the members all feel that the Exhibit was a Success and that the advertising value to the Society was considerable.

Mr. George Bender, one of our pioneer model builders, exhibited an English steam locomotive, "Sir Gilbert Claughton" 4—6—0 L. N. W. R. No. 1 gauge, with baggage car and two passenger coaches. His D. L. W. R. R. Steam Locomotive No. 1106, 4—6—2 Pacific 7/16 in. scale, 2 in. gauge. A P. R. R. passenger car ¼ in. scale. King George V Locomotive and four Passenger cars. A fine Model, D class, racing yacht, and a rebuilt Whitney 2-cylinder marine steam engine.

Mr. J. Lozier exhibited a ⅜ in. scale freight train, a ¼ in. scale Atlantic Locomotive with Baker Valve gear (built by L. B. S. C.) and a ½ in. scale locomotive. A Model of a Steam freighter, and ⅛ in. scale steam Ocean Liner.

Mr. Minton Cronkhite, exhibited his ¼ in. scale Broadway Limited with K. 4s P. R. R. 4—6—2 locomotive electric drive, club car, two 12 section Pullman cars, a diner and a 12 section sleeper observation car. Placed upon a fine piece of track with gantry electric signals and electric point motor switches. Also a K 4s, ¼ in. scale Pacific Steam Locomotive.

Mr. E. Thorp a ½ in. scale Pacific locomotive. A ⅜ in. scale Atlantic locomotive, and a model power boat hull.

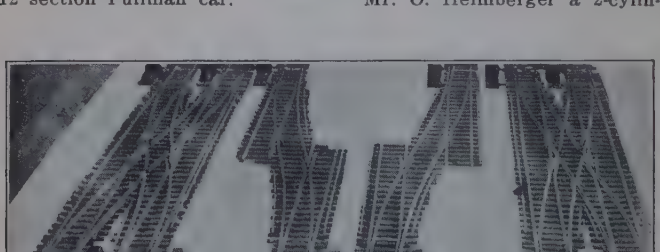
Mr. F. Dobler. a ½ in. scale K 4s Pacific 4—6—2 locomotive. A No. 1 gauge Paris-Lyons and Mediterranean Pacific Locomotive.

Mr. D. Hewitt a ¼ in. scale Pacific locomotive. A ¼ in. scale combination passenger and baggage coach.

Mr. F. Icken, a ¼ in. scale mixed traffic 4—6—2 Pacific, Richmond and Washington Railway Locomotive with Baker Valve gear, steam line with Icken electric drive. Also scale electric colored signals, and electric switch motors.

Mr. R. Claudius exhibited some fine models. A ¾ in. scale "Hudson" type N. Y. C. locomotive. A ½ in. scale "Hudson" N. Y. C. Locomotive. A ½ in. scale DeWitt Clinton train, locomotive and three coaches. A ½ in. scale club car N. Y. C. Two large locomotive cut outs printed in color. A collection of pictures and two solid (paper weights) representing 3/16 in. scale DeWitt Clinton train, and a 1/16 in. scale Hudson type N. Y. C. Locomotive.

Mr. R. Ward, ¼ in. scale steel P. R. R. Box Car. A ¼ in. scale 12 section Pullman car.



Mr. H. Lundberg, ½ in. scale K 4s P. R. R. Pacific Locomotive.

Mr. E. Alexander had a very assorted exhibit, specimens of Railway tract, single and double ¼ in. scale cross overs, points and switches, electric signals. Models of a cross channel passenger steamer, a tug boat, and a freight boat. Twelve waterline Models of steam ships. A ¼ in. scale A. B. & A. locomotive. A ¼ in. scale English freight train. A ¼ in. scale model turntable. ¼ in. P. R. R. passenger cars and 12 section Pullman cars. A ½ in. scale type "D. D. —1." Construction sets for ¼ in. passenger and baggage cars. ¼ in. scale naval gun.

Mr. A. Bosshardt exhibited his Model speed boat with gasoline engine. A single cylinder 4-cycle gasoline engine, marine type, and a large model of a Merry-go-round with rocking sail boats, run by an electric motor.

Mr. J. Landau a naval quick firing gun on ship stand using .25 fixed ammunition in gunmetal a fine piece of work.

Mr. O. Heimberger a 2-cylinder vertical marine steam engine with reversing gear.

Mr. H. Lundberg, a 2-cylinder marine steam engine.

Mr. R. Clapp exhibited a Class R racing sail boat and a model of an Elizabethan Royal Ship.

Mr. W. Fernald a fine model of the O. & W. R. R. sea going tug "Ontario."

Mr. M. Bolles a mahogany speed boat, powered with a Bohaboy 4-cylinder uniflow steam engine and powerful boiler.

(To be continued)

BOOK REVIEWS

The Making of a Sailor, or Sea Life Aboard a Yankee Square-Rigger by F. P. Harlow, 377 pages, 26 page plates, 9¾ x 6½ in. cloth $5.00.

Many men, when boys, had a desire to go to sea. To a few their desire became a reality with more or less success. To some the first voyage disillusionized them, whilst others kept to the sea as a profession. This book records the early experiences of a lad with the desire to become a real seaman. Brought up among seafaring folks, amidst the true atmosphere of an old time sea port he starts off at the bottom of the ladder in a schooner, and after a round trip during which the boat puts in at several ports he arrived safely at his home port. After a spell ashore he signed on for a voyage in the Ship Akbar to Australia, and return. The book is well written and extremely interesting, showing not only the hard, trying life of the seafarer with its storms and other dangers, but the sunny side with its carefree life and detailing many amusing incidents. It is well worth reading, and gives a pretty clear insight into the life of the man before the mast.

Spons' Household Repairs—An Illustrated Guide for the House Owner, 124 pages, 115 illustrations, 7½" x 5", cloth, $1.00.

Gathered within the covers of this practical handbook is a great deal of useful information on a wide range of subjects that will prove of considerable value to a practical man who "does things" about the house. It is a work that should be added to the practical man's reference library.

Early British Railways—A Short History of Their Origin and Development from 1801 to 1844, by Henry Grote Lewin, 202 pages, 8 folding maps and 8 page plates, 8¾" x 5¾", cloth, $5.00.

An extremely interesting work, commencing with horse railways mixed traction; the steam locomotive; foundations of the British railway system; the end of the railway boom; the opening of many lines; first steps toward state control; terms of future ownership by the state; number of companies; mileage opened from 1821 year by year to 1844; index, etc.

"The Use of Models in Power Plant Engineering," by J. H. Walker, is the name of an illustrated pamphlet gotten out by The Detroit Edison Company, 2000 Second Ave., Detroit, Mich., stressing the value of scale models and showing some of them that were built to illustrate the Power Plants and the Design. We have no doubt they will be pleased to forward any of our readers a copy of this interesting pamphlet.

Mr. Isaac Purington writes us that they are organizing a Model Engineers Society, but they would like to hear from anyone interested residing within a reasonable distance of Vancouver. Address Mr. Charles E. Wright, 2922 38th Ave., West, Point Grey, Vancouver, B. C., Canada. The phone number is Kerrisdale 2010-R. We hope that this notice will catch the eye of all of our readers on the west coast of Canada.

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Two-Cylinder Single Acting Enclosed Marine Steam Engine, ¾ in. x ¾ in., quite new, $15.00. Also Single-Cylinder Air Cooled Wall Gasoline Engine, quite new $40.00. Lockwood, 75 North 7th Street, Newark, N. J.

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Prototype Outline Drawings: Pacific, Hudson, Mountain, Micado, and Limatype Locomotives, ¼ in. Scale. $1.25 (Money Order) each. Alf. Ellefson, Glenwood, Minn.

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Industrial Alcohol, the Manufacture of from farm produce, by F. B. Wright, plainly written, fully describing and illustrating the various processes. 271 pages cloth bound, $2.50. Spon & Chamberlain, 120 Liberty St., New York, N. Y.

A B C of the Steam Engine, describing a high speed single cylinder, double acting, horizontal steam engine, and automatic governor, with large drawings, and descriptive matter, price 35 cents.

Model Airplane, a bi-plane single seater, drawings and full description. The Modelmaker June and July, 1926, 20 cents, postpaid. Spon, 120 Liberty St., New York.

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Mr. J. A. Baker, Jr., regrets to announce that, owing to ill health and under orders from his physician, the complete closing of his railway until October, 1929. All invitations to visitors are regretfully cancelled.

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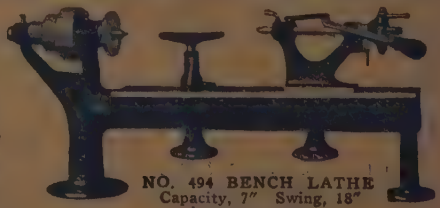

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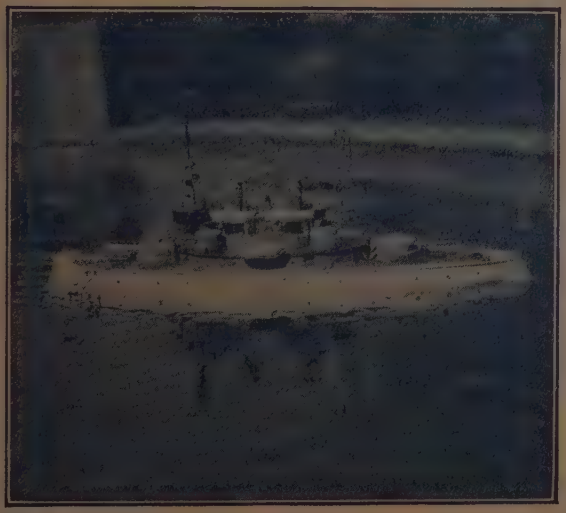

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Published by SPON & CHAMBERLAIN

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Editor—W. Edmunds Spon

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Vol. VI. No. 3

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OUR FOREWORD

We have already had a number of replies to our request in Our Foreword in the February issue of The Modelmaker, and we hope to hear from other of our readers, as all these requests will receive careful consideration.

The following are some of the suggestions:

Blueprints and castings for a Corliss Engine.

Stationary Steam Engine and Boiler, horizontal or vertical.

A Marine Walking Beam Engine.

Blueprints and castings for a bench shaper, hand or power driven.

A single cylinder high speed marine engine for a speed boat, about 40" O. L.

Blueprints and castings for an Atlantic type locomotive of as simple construction as possible for beginners who hardly feel like tackling a more complicated model.

Plans and materials for an up to date speed boat with power plant.

Blueprints and complete sets of material for railway rolling stock, passenger cars, mail cars, pullman and diners, freight cars of various kinds.

Blueprints, and materials for a model battleship of metal construction.

Blueprint and materials for a model steam driven cargo steamer of metal construction.

It is of course understood that there would be a series of constructive articles with illustrations, one a month, and that the materials for each article could be purchased on The Modelmaker part payment plan.

The above subjects have given us an opportunity to sound out some of our good model material men, and we know that in some instances the suggestions have been taken up, and that we shall be in a position to announce shortly the next subject to follow Mr. Lockwood's excellent articles on the Wall Gasoline Engine.

In this case the next article will be quite a new departure, yet one that will appeal to many of our old time men, and especially so to a number of new men who are much interested in model construction and operation.

When writing for information please enclose stamped and addressed envelope for reply.

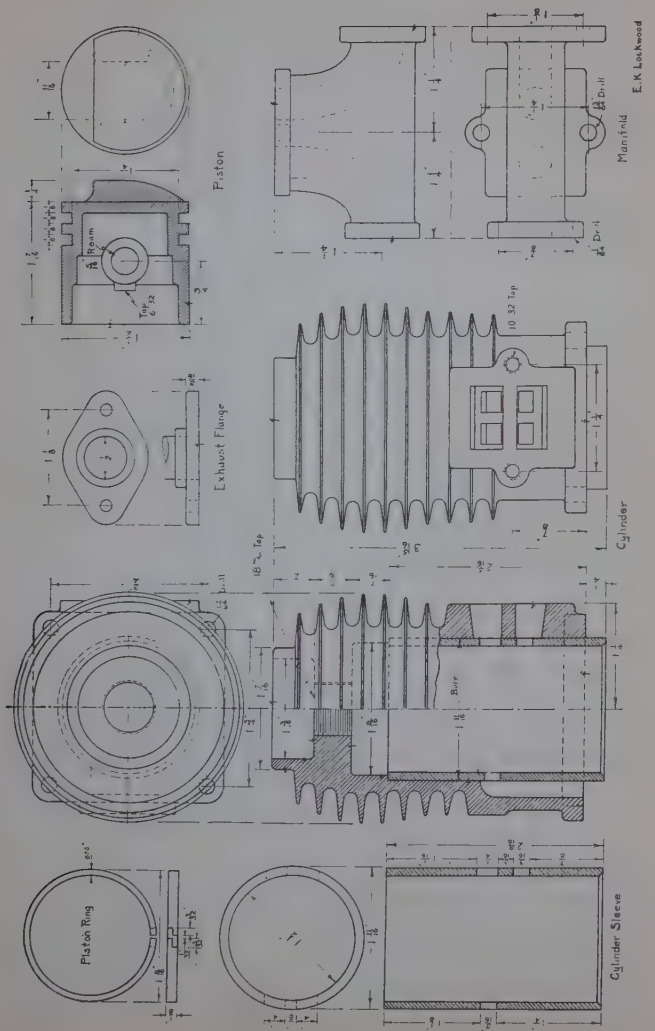
THE CONSTRUCTION OF A MODEL GASOLINE ENGINE

By Mr. E. K. LOCKWOOD

(Continued from page 33)

We now pass to the machining of the cylinder. It will be noticed that there is a chucking piece cast integral with the top of the cylinder, and the first job is to machine this true. Take the casting and chuck it using the inside jaws inserted in the cored bore. The chucking piece may now be turned true after which the cylinder should be chucked by the chucking piece and the inside machined out as required and the bottom faced off. This accomplished, reverse cylinder again in the chuck and chuck as before but use a strip of blotting paper in order to prevent the jaws from marring the bore just machined. The top of the casting may now be finished as shown and while the cylinder is still chucked, bore out the hole for the spark plug tap which is a standard 18 mm. spark plug tap. The casting may now be removed and the face against which the manifold fits should be filed flat and true. After marking out for the manifold screws, these should be drilled and tapped for 10-32 screws. Now locate the holes in the cylinder flange as shown and drill them with a No. 9 drill. After tapping the hole for the spark plug, the cylinder may be laid aside.

The cylinder sleeve is machined and fitted. This is made from a piece of seamless steel tubing. The tubing should be chucked and the inside bored out slightly under size and the end faced off. Now locate the position of the port holes. These should first be drilled and then filed square or rectangular as indicated in the drawings and then remove any burrs. A special mandrel should now be made out of a piece of scrap to fit the sleeve. After mounting in the lathe, the outside of the sleeve may be finished off to a good force fit for the cylinder and the other end faced off making the sleeve the proper length. Now remove from the mandrel and after applying a little white lead or oil, the sleeve may be pressed into the cylinder being careful to get the ports in the proper position. When the sleeve has been forced home, the bore may be reamed to the required size or if one has a four jaw independent chuck, the cylinder may be chucked and a finishing cut taken in the lathe or better still it may be ground out. If the latter methods are adopted, it would be best not to machine off the top of the cylinder casting until this has been accomplished. The reason for suggesting this method is that there is a chance that sleeve may be slightly distorted when forcing it into its place and by finishing the bore afterwards


Piston
Ream
Tap 6-32
Exhaust Flange
Manifold
E.K. Lockwood
Drill
10-32 Tap
Cylinder
18-32 Tap
Bore
Piston Ring
Cylinder Sleeve

it insures a perfectly true cylinder. This would cause a better fitting piston and consequently greater compression and a better running engine.

There is a casting supplied for making the piston rings and these should now be made unless it is desired to buy these already finished. The casting should be chucked by its chucking piece and turned to the dimensions given, and the rings parted off the required width. They should then be filed and split as shown. This should be done very carefully if a good ring is to be obtained.

Now take the piston casting and chuck it using the inside jaws inside the piston and turn the chucking piece true. Reverse in chuck and turn the outside diameter down to the proper size. The piston should be just a nice sliding fit into the bore. The bottom of the piston should be trued up and I think that it is advisable to finish inside of the casting as far as the bosses. This would make the skirt of the piston a uniform thickness and would cause equal expansion when heated. The ring grooves should now be turned with a parting tool. Use the rings already made as guages for the rings when placed in the grooves should not have any motion along the axis of the piston. In other words the grooves must be just wide enough to allow the rings to slip in freely. Now chuck the casting using inside jaws as originally and part off the chucking piece after which the casting should be removed and the wrist pin holes located. These may be drilled from either side slightly under size and then a 5/16" reamer past all the way through both holes. Now drill and tap the holes for the wrist pin set screws as shown.

The manifold is finished off next. This may be done by chucking it by the flanges and and the ends faced off making sure that it is running true before machining. The face which fits against the cylinder may be machined by chucking by the body of the castng. The casting will not be centered on the chuck but this does not matter as it is only desired to machine the surface flat. Now mark off the holes as required and drill same. The manifold may now be laid aside.

The exhaust flange casting should first be drilled and reamed for ½" copper pipe. Mount on a mandrel and machine as desired. After locating and drilling the holes in the flange, the parts may be assembled.

The next article will describe the machining of the carburetter and then one should have a complete engine ready to try out.

(To be continued)

Mr. George Braun, Campbellsport, Wisconsin, writes us he would be interested in an article on the construction of a stationary steam engine and boiler, horizontal or vertical as he has no room for a model railway system. He would be glad to hear from any of our readers in his section with a view to an occasional meeting for mutual benefit.

Mr. Wm. C. Wood, 156 Fifth Ave., New York, N. Y., would like to get a small quantity of the real green paint as used on Pullman cars. Can any of our readers advise him where it can be purchased.

THE MINIATURE FAIR OF THE IRON HORSE

This Exhibition of Model locomotives, rolling stock and railway equipment was held in Mr. Minton Cronkhite's new building recently completed on his Estate at Greenwich, Conn. It is a two-story building, 86 ft. by 36 ft., lighted by electricity. The upper floor will be devoted to his ¼" scale railway system.

There was a good gathering of men interested in model railways, including Mr. A. L. Ralston, Chief Engineer-in-Charge. mechanical equipment, N. H. R. R. and Mr. O'Mara in charge of Electric locomotives of N. H. R. R., and prominent Model Engineers a number of whom loaned some of their Models.

The most important items of Mr. Cronkhite's present equipment were: The Broadway Limited consisting of P. R. R. Pacific K 4s, 4—6—2, club car, two 12-section Pullmans, dining car and 12-section sleeper-observation car.

Mountain Type M 1 Locmotive, twelve freight cars and caboose, all steel.

Express train, all steel, consisting of P. R. R. K 4s Pacific locomotive express car, combination baggage smoker, three day coaches, diner and two pullmans.

Local Passenger P. R. R. D 16 4—4—0 American locomotive express car and two day coaches.

Pennsylvania Multiple Unit three car electric train, Icken powered.

Also a number of P. R. R. K 4s locomotives, and other rolling stock, track, etc.

Mr. Baker of Darien, Conn. loaned the following:

Corridor train—L. M. S. 4—6—0 Locomotive, three Composite 1st and 3rd class cars, and combination 3rd class and baggage car.

Express train—N. Y. N. H. & H. R. R. 2—6—2 Electric locomotive, express car and three pullmans.

Electric Switcher locomotive 0—8—0.

Mr. Levy, N. E. R. Steam locomotive 2—6—0, three coaches and a single platform Depot.

Mr. Douglas Arthur loaned the following:

Southern Pacific train Pacific 4—6—2 combination Southern Pacific Limited, two 12-section sleepers, club car, diner and 8-section observation car and a single platform depot.

Atlantic Rock Island tank locomotive, box car, flat car, and R. I. caboose.

Mr. Lozier, showed two locomotives, G. W. R. R. 4—4—0 and G. N. R. 4—4—2.

Mr. Hewitt, Locomotive and N. Y. C. R. R. combination car.

Mr. A. Meggett, Jr., Ingersoll-Rand 60-ton Chicago, Milwaukee, St. Paul and Pacific oil electric 4—4 "O" gauge locomotive, Icken powered.

Mr. F. W. Icken showed two locomotives he has built for Mr. Washburn's "O" gauge Electric Railway, mixed traffic 4—6—2 Pacific, Richmond and Washington Railway locomotives with Baker Valve gear, steam outline, with Icken electric drive.

Mr. E. P. Alexander showed a number of passenger cars, examples of single and multiple track, cross-overs, switches and signals.

The most unique oufit was a Model train circa 1893, locomotive, and cars still in good running condition made in Munich.

This was certainly a most interesting Exhibition, and such gatherings do much towards increasing the interest and enthusiasm in this class of Modelmaking.

Mr. Cronkhite has a building that will enable him to lay out and operate a very comprehensive railway system with opportunity for a great variety of scenic effects. It will be equipped with electric signals, electric motor switches and the whole system electrically operated. We wish him every Success in this great undertaking.

Mr. E. T. Pachasa, 1866 West 57th St., Cleveland, Ohio, who has written a number of articles for the Modelmaker on model Airplane construction advises us he has been elected Secretary of the Cleveland Glider Club (full size gliders) and if any of our readers are interested in this new sport we would suggest they write him for full particulars.

Mr. H. J. Coventry writes us he is negotiating with Messrs. Hamley's of London, England, to handle the castings and drawings of his "President Washington" Locomotive. This will be a great convenience for our English and foreign readers who contemplate building one of these splendid models.

The Editor,

The Modelmaker,

Dear Sir:

In response to your Foreword in the February issue of "The Modelmaker," I will open up and give you my views on the subject of The Finance Plan, you have initiated in "The Modelmaker."

I think it is an excellent idea, and should win over many converts to the art of model making. While I have a workshop, and an excellent screw cutting lathe, I am not at present fitted to build models of any sort. I am very busy at present equiping my shop, as I am making a good share of the equipment, it will take me some time. I am very much interested in model making of all sorts, and intend to build models some time. But to return to The Finance Plan, I think your idea of a 2 in. scale Model of a Marine Walking Beam Engine for a side wheel ferry boat is fine, and personally I would like to see the description of building it appear in "The Modelmaker." I think that a stationary engine with about a 1 in. bore, and a 1½ in. stroke, of a horizontal type with reversing gear, and boiler to match would be fine. I also think that a simple ½ in. scale model of a 4—4—0 American type locomotive, as simple as possible so that beginners would not be afraid to tackle it, would also be very taking.

I hope I have conveyed my ideas to you, and not taken up too much of your valuable time.

Yours respectfully,

ROBERT HANNUM

512 Hannibal St., Fulton, N. Y.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 29)

Cradle Casting, Bumper Beam and Coupler Pocket

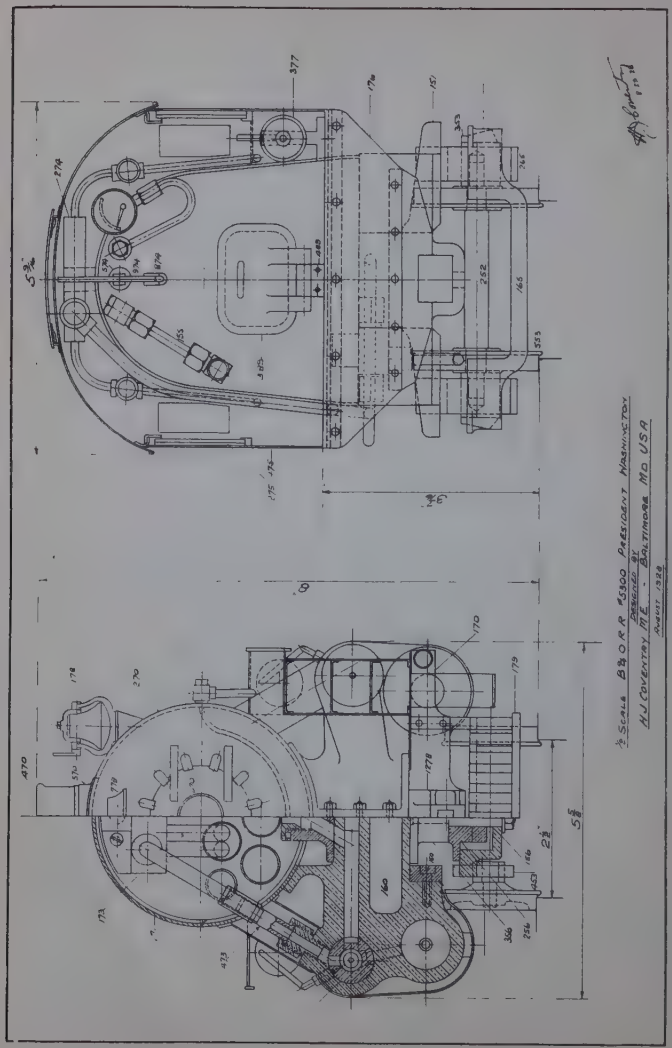
The rear frame cradle is a one piece casting which will require very little work to finish. The front portion fits between the frames in the milled recesses. While the back contains the draw bar pocket and cab support. The boiler is carried in 1/16 in. plates which will later be screwed to front and rear of cradle. As the casting is inclined down from back to front, it will be awkward to mark out, so lugs are cast on top rail to level up. The Casting should be first cleaned up and then laid down on surface plate, lugs down. Mark out the end that fits in frame also cab support at rear end, and the lugs on sides at front which carry the rear driver brake hanger. Machine or file up the frame fit getting the faces square parallel and exactly to dimension. Drill and tap the brake hanger lugs also the holes for drawbar, and trailer truck pivot pin. Saw and file out the openings for brake hangers and this will complete the cradle for the present.

Bumper Beam

is another one piece casting that will be easy to finish. It should be cleaned up all over, and parts marked finished with file to exact dimensions given. The semicircular recesses or outer corners are known as pushpole pockets and are to be drilled or milled with a round edge flat drill. To make the drill, take a piece of ¼ in. drill rod and turn the end semicircular, then file flat to make the blade, say about 1/16 in. thick. Back off the cutting edges carefully with a fine file. To harden small tools made from drill rod, it is advisable to first anneal, by making red hot and allowing to cool slowly in ashes or lime. Then again make bright red preferably in gas flame or blow torch and quench in oil. Do not simply drop the red hot tool in the oil and leave it there, but keep it in the tongs and agitate the whole for a few minutes. Take out and clean up with emery cloth, till bright. Then dip in thick oil and move in and out of flame till the oil just catches fire, quench out in water and the tool should be hard and tough. Another way is to harden in water, clean up bright and hold in flame turning the tool over and over till the bright natural color changes to first bright straw and then orange. Quench in cold water at this point.

The coupler pocket casting may be filed up to dimensions and attached by four No. 2-56 screws. Having cradle and bumper ready we are in a position to line up the two frames.

Take one frame, and the cradle and fit the recess in rear of frame over the faced end of cradle. If you have done the milling carefully the fit will be firm, if you have to use light


½ SCALE B&O R.R. 4-6-2 PRESIDENT WASHINGTON
H.J. COVENTRY M.E. DESIGN
BALTIMORE MD. U.S.A.
AUGUST 1938

taps with a small lead hammer so much the better, but be very careful in using the hammer and have the frame well supported on a flat surface. Another method would be to gently squeeze together in the vise. Inspect carefully to see that the surfaces of frame and cradle at joint are "home." Now lay the top frame of rail on a flat surface. The cab support flange at end of cradle should then show 5/32 in. above the frame top rail. See Fig. 26. Next place a 5/32 in. parallel strip under the cab support flange, and seat the

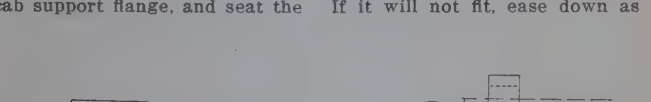


Fig 25

cradle firmly upon it, take the square and see if the frame is fair and square. If the work does not check in either or both tests, ease down the cradle end at joint very carefully. Remember, a mere scrape taken off inner or outer edge of joint will raise or lower the cradle considerably at cab support flange. If you are so unfortunate as to make the fit "sloppy" the situation may be saved by tinning the joint liberally with solder, treat both frame and cradle, then have the frame on the flat surface with the 5/32 in. parallel under cradle end. Heat the joint till the solder melts and cramp together with a C cramp.

Assuming everything is correct, drill and tap for screws.

The bumper can be fitted and lined up the same way adjusting the surfaces so that when screwed up it will be square and "lineval" with the other end of frame namely the cradle. If the work is all done carefully and made correct, it will be a simple matter to fit the other frame. To do this lay the three units you have already done top rail down on surface plate with the 5/32 in. parallel under as before. Take the other frame top rail down and slide it right up into position. It will go without any persuasion or protest if correct. If it will not fit, ease down as required and cramp in position using a C cramp at each end. Check everything over and see if the pedestal faces are square with each other from frame to frame and when satisfactory, drill and tap for screws. If you have not made a good job of the joint on this last frame, do not solder because it will be necessary to take apart to fit cylinders.

By this time you will have something to show for the labor spent, and no doubt you will wish to try the cylinders in place without being told to do so. They should slide down over the frames nice and snug. If they do not without forcing the frame in, ease down the frames a little each side, or ease out the cylinder frame

seats. If the fit is a loose "rattly" one, the only thing to do is to take up the "rattle" with shim brass or copper, equally each side.

Now take one frame off and detach one cylinder from its mate. Place the frame and cylinder together cramp in position and give the frame edge a gentle tap with a soft hammer to make sure it is bearing. Spot through the holes in frame with No. 30 drill, just a countersink is all that is needed to give a true lead to the No. 39 which will be tapping size for the required No. 5-40 screws. Be careful in drilling that you do not go too deep or you will go through into the cylinder bore, 3/8" from face of cylinder seat is ample depth. Screw the cylinder on firmly, then take the other cylinder and bolt to its mate—place the frame in position and screw to cradle and bumper. Cramp this last cylinder firmly to the frame. Now take out the screws holding the two cylinders together also the screws holding the frame to bumper and cradle. You now have the frame only with its cylinder cramped in position. Drill and tap for No. 5-40 screws as before and reassemble. If every screw goes in without undue force and all is square you may well afford to congratulate yourself. One more test may be applied before setting this portion aside. That is, to check the parrallellism of cylinder bores to frame. Place a 13/16 in. mandrel or any good fitting length of stuff in the cylinder bore. Then feel between the mandrel and frame with the inside calipers. They should slide through evenly at any point and the dimension should be 19/32 in.

Next month the Frame braces, Motion Beam and Guide Yoke will be taken.

(To be continued)

Mr. William N. Witmore, 42 South 28th Street, Penbrook, Pa., writes us that he has just finished a model 2-cylinder 4-cycle Gas Engine, 1¼" bore by 1 5/16" stroke, water cooled, suitable for a Model Power Boat. He is now in the market for blueprints and materials from which to construct a model power boat hull suitable for this engine. He would like to get in touch with any of our readers residing in his district with the object of an occasional meeting for mutual benefit. We hope that he will soon be in possession of a suitable hull as we understand there are quite a number of model power boats being built that will be operated by gas power. We would like to see some good races run off this year amongst this class of boats.

Mr. C. Holt of Greenwich, Conn., writes that he has booked orders that will keep him hustling until next January. Also that he does not publish any catalogue or lists as the majority of his work is for special orders. He has some fine photos of Locomotives he has built, price 50 cents each, postpaid.

Mr. H. W. Pontin, writes that he is preparing to supply post card photos of American Model Locomotives built by such firms as, Coventry, Birch and Icken, and that he is in correspondence with other prominent firms. He will announce fuller details next month. Why not start your photograph album now?

ANNUAL EXHIBITION OF MODELS

NEW YORK SOCIETY OF MODEL ENGINEERS

Chairman—MR. WALTER ELLIOTT
Secretary—MR. F. DRAYTON GRIMKE

(Continued from page 36)

Mr. W. Elliott, the hull of the "Mystery" model speed boat, which made about 30 M. P. H. with Mr. F. Zimmer's steam power plant, a 12 in. mahogany hull of a speed boat for outboard motor and a new mahogany hydroplane speed boat hull.

Mr. C. Karthaeuser a 6-cylinder Rotary Compressed Air Engine.

Mr. N. Habl a single cylinder 2-cycle gasoline engine. A 2-cylinder poppet valve steam engine. A 2-cylinder single acting M. T. B. Steam Engine.

Mr. E. Lockwood a single cylinder 2-cycle air cooled gasoline engine. A single cylinder 4-cycle air cooled gasoline engine, suitable for a model power boat hull. A 2-cylinder single acting marine steam engine.

Mr. A. Bauer showed a number of small airplanes.

Mr. F. D. Grimke had quite a varied exhibit. Model steam Power boat "Black Bottom," ⅜ in. scale. Atlantic locomotive, ⅛ in. scale. G. W. R. tank locomotive, ⅛ in. scale Sir Bors de Ganis. ¼ in. scale English locomotive cylinders. ⅛ in. scale passenger coach, ⅛ in. scale dining car G. W. R. and ⅛ in. scale switch. 2-cylinder poppet-valve Marine Engine. 1-cylinder poppet-valve Marine Engine. 2-cylinder Piston Valve Marine Engine and a 2-cylinder slide Valve Marine Engine.

Mr. A. Meggett, Jr. exhibited his ¼ in. scale I. R. Oil Electric 4—4 "O" gauge, Ingersoll Rand 60 ton C. M. St. P. P. R. R. Locomotive, Icken powered.

Mr. A. Smith ¾ in. scale Pacific U. S. S. R. R. A. A fine specimen of a garden railway locomotive having already run nearly 1,000 rail miles. Also a model of a French pumping engine and boiler.

Mr. Calvert Holt's Exhibit was a very representative one, showing very clearly the line of model locomotives and cars he has already placed upon the market as follows:

Arranged on a large square board were samples of many sizes of ¼ in. scale driving wheels, from 54 in. to 80 in. scale sizes, also a number of truck frame parts.

On another similar board were displayed various castings for ¼ in. scale locomotives, steam type.

Another display board had three types of "O" gauge brass boiler shells, for steam or electric drive.

A fourth board had a fine assortment of boiler and engine fittings, pumps, copper boiler plates and steam gauges.

A fifth board displayed sets of car sides and parts in sheet brass for ¼ in. scale finished and in the rough.

There was also an assortment of castings of cylinders for various scales.

Complete sets of locomotive castings for 2½ in. and 3½ in.

including Hudson Type in both gauges. These can be had rough, or finished, as desired.

All of these designs were for strictly scale models, and of excellent workmanship.

His ¼ in. scale locomotives are of the steam type with electric motor drive of special design. This scale is very popular as it enables a model railway fan to lay out a complete working system in a small room.

A Model P. R. R. freight caboose and construction sets.

A ½ in. scale Pacific P. R. R. locomotive chassis a fine piece of work.

Also a number of photos of model locomotives he has built for customers.

A ¼ in. scale M. I. P. R. R. locomotive steam type electric drive.

A ¼ in. scale P. R. R. Tender.

Mr. Chas. A. Cole writes us he has been an enthusiastic Modelmaker since boyhood, and has built a number of Models. One of his latest is a twin screw steam powered Destroyer, 4 ft. 6 in. long, also a Ford Pacific Locomotive. similar to the one recently described in the Modelmaker. It has always been his wish to help his brother Modelmakers in their work so he has now entered the Modelmaking field prepared to supply material, castings and fittings. To get in touch with our readers he is prepared to send his new Catalogue free for a limited time to anyone sending a stamped and addressed envelope. We hope all of our readers in his territory will write this gentleman, and get acquainted with his line of supplies.

MODEL OF BATTLESHIP U. S. S. MASSACHUSETTS

Built by Mr. George H. Olin

I am sending you three photographs of my Model of an American Battleship that belonged to the famous White Squadron of the "late '90's." This Vessel was built by the Wm. Cramp Co. of Philadelphia in 1896 and reconditioned and improved in 1910.

My model is built to scale from blueprints of the 1910 plans given to me by the Bureau of Construction and Repair of the Navy Yard.

I spent a little over one year of my spare time in its construction.

The Model is 42" O. A., 8½" beam, 6" draft, and 22" Keel to truck. Total weight 28 lbs.

The guns are of steel, turned and bored.

The Model is driven by an electric motor, run by four dry cells. She has twin screws, and has logged 4 miles per hour.

The illustration on the front page of this issue shows her under weigh in the pond.

If you have not already sent in your renewal to The Modelmaker for 1929, we would like to hear from you at an early date so that we can bring our subscription list up to date. Please give this your immediate attention.

We can now supply complete sets bound in cloth gilt of The Modelmaker from Volume 1 January 1924 to December 1928, 5 volumes. (See December number for full contents of these volumes.)

The Editor
The Modelmaker
Dear Sir:

Enclosed please find check for $1.00 for regular subscription to The Modelmaker.

I am now engaged in building a Model Railway System, using for track Mr. F. Birch's ½" scale aluminum rail, as well as some aluminum and brass from American Model Railway Company. At present I am using 1" x 1" x 4½" ties, cut from 1" x 1" planed yellow pine timber, spiking same with No. 3 and No. 2 carpet tacks. Relative to tacks, I find these very satisfactory, since they hold rail to true gauge, and are easily pulled with screw driver or small pliers.

My system so far consists of 7 switches, turntable, run-around track (3 ft. Radius), two R. R. crossings and two connection tracks. Have only built about 50 feet of "main line" but have two curves with transition spirals, and one pure circular curve, super elevation to correspond to standard A. R. E. A. Everything is to scale except ties. Have completed an Electric Locomotive employing a high speed fan motor geared to 4 driving wheels, using 110 volt A. C. through 2 step transformer. This is a very powerful little locomotive, but I am more interested in steam working models, one of which I am now trying to construct with parts obtained from Mr. E. P. Alexander, and Mr. Frank Birch, everything built to ½" scale throughout.

Some time ago I took this modelmaking up as a hobby, and find it extremely fascinating, since I have always followed engineering, civil and mechanical, specializing in railroad construction and maintenance. I use regular practice adapted to small scale.

Yours very truly,
G. M. M. James,
Wrightsville Sound, N. C.

We have just received a very nice letter from Mr. C. A. Marks 405 Ford Ave., Ogdensburg, N. Y. renewing his subscription to The Modelmaker ,and informing us that he is specially interested in boats, marine and stationary engines. He is now at work on a Model 2-cylinder Vertical Single Acting Piston Valve High Speed Engine, which will be direct connected to a rebuilt auto generator. He intends to use this set for recharging his radio batteries. He would like to get in touch with anyone interested in modelmaking in his district. He informs us that he is connected with the Car Department, of the N. Y. C. R. R., and would be very glad to help any of our readers, who are building model railway cars, and would like some real inside dope. When writing for information please don't forget to enclose stamped and addressed envelope.

Alfred Paul & Son write us that they have received letters from our readers, some enclosing money, in which the writer has forgotten to include his postal address, and in some cases has omitted his name. They hope that this notice will be seen by these particular readers and that they will immediately correct their errors.

Have you a friend who might be interested in Modelmaking. If so show him a copy of The Modelmaker, or send us his address and we will be glad to mail him a copy.

P. R. R. K 4s LOCOMOTIVE
Built by Mr. F. J. Dobler

I enclose a photo of my locomotive, ½" scale, 2½" gauge, steam driven, which I built from a set of Coventry castings and blueprints.

I commenced its construction in 1925 working evenings and Saturday afternoons. At first I had a very limited outfit, but I gradually added to it a 9" Summit Screw cutting lathe, Drummond hand shaper, Steptoe miller, drill press, micrometers, drills, reamers and hand tools of various descriptions. So now I consider I am pretty well equipped for new work.

This Model was awarded the Havemeyer trophy by the N. Y. Soc. M. E., and was also on exhibit at their recent Exhibition in New York.

It has been loaned to The Port of New York Authority, and is included in their Exhibit in the Leipzig Exhibition, Germany, as a representative locomotive used at the Port of New York.

The Editor,
The Modelmaker,
Dear Sir:

Judging from some of my correspondents remarks there seems to be an impression in some few cases that it is now too late to start number one section of my new B. & O. Model, seeing that number five section is now out. This is a mistaken idea. Anyone can start section one now, section two next month, and so on every month.

There is no set time of starting, but having started I would appreciate it if my customers would send their order and remittance for the section as soon after the 15th of each month as convenient.

This will assist in expediting delivery by enabling me to have stock ready.

Cordially yours,
H. J. Coventry.

Mr. Clifford W. Wintle, Honeyville, Utah, would like to know where he could get a good gas burner for heating model locomotives. Also air pumps for model locomotives.

Have your Modelmaker bound. Return your Numbers to us with remittance for $1.10 for each Volume, and we will send you new bound volumes per Express or Insured Mail.

WHAT'S IN YOUR GARRET?

SALE—EXCHANGE—WANTED

EVERYTHING HAS A VALUE—SOME OTHER FELLOW WANTS IT IF YOU DO NOT

Advertisements under this Head 5 cents a word minimum 10 words, letters or figures count as words, compound words as separate words. Remittance to accompany copy.

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Maximum Single Advertisement Under This Heading Fifty Words.

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Castings for Locomotives and Stationary Engines. Drive Wheels, O-Gauge to 1 in. scale. Miniature Nuts and Bolts. Cylinder Drain Cocks. Boiler Fittings. Send your difficult Machine work to me. Super detail Models made to order. List 5 cents. Frank Birch, 131 West Elza Ave., Hazel Park, Detroit, Michigan.

High Grade Model Airplanes and Supplies. List 10 cents (coin). Cleveland Model & Supply Co., 1866M West 57th Street, Cleveland, Ohio.

Outline Drawings of: Pacific Hudson, Mikado, Lima, Mountain type locomotives, $1.25 each. Freight trucks, 3/8" and 1/4" scale, Photo 10 cents. A. Ellefson, Box 587, Glenwood, Minn.

High Grade Ship Model Fittings. Send dime for Catalog. A. J. Fisher, 1002 Etowah Ave., Royal Oak, Mich.

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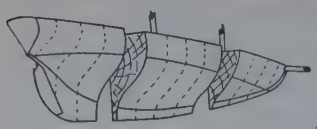

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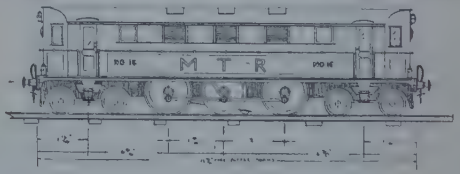

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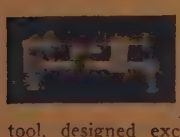

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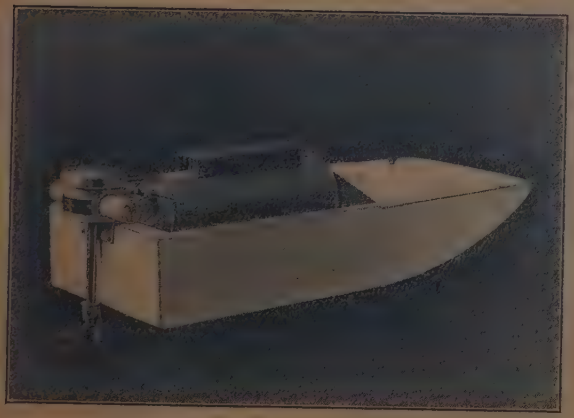

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THE MODELMAKER

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Editor—W. Edmunds Spon

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Vol. VI. No. 4

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OUR FOREWORD

Model Power Boat fans will be interested in the new Model Power Plant which is featured on the front cover of this issue of The Modelmaker.

It is certainly quite a new departure in model power plants from the accepted types used in all parts of the World, but there is no reason why it should not prove as efficient as any of its predecessors and not unlikely may make a record that will surprise all the old timers.

The records made in the past year with outboard motors on hydroplane hulls, or sea sleds have put many a fast steam speed power boat in the shade.

There is no reason why this type of engine in a model power boat should not prove as great a success as in the full sized outboard motorboats.

One of our readers is busy perfecting a model steam turbine plant for his power boat hull, and he expects to get good results from his labors. He has already had success with other steam powered model boats.

There is also another new power boat that will be ready for its trials in a few weeks.

It is a 52" O. L. hull accurately scaled down from full sized drawings of a very fast speed boat, designed by one of our best known speed boat designers. This hull will be powered by the latest type Bosshardt four-cylinder, four-cycle water cooled gasoline engine, with over-head valves. This engine is now on the stand ready for the builders to run a series of tests, for speed, endurance and reliability.

There is also the new Wall two-cylinder, two-cycle, water cooled gasoline marine engine, 1½" bore x 1¼" stroke, that under tests, running light, has turned over at 7,200 R.P.M., to be reckoned with.

It is to be hoped that arrangements can be made during the coming season to have an open competition for these new boats that will try them out and enable their owners and others interested in model speed boat racing to make some real comparisons as to the merits of the various types of boats and their propelling mechanisms.

If any other of our readers are working on new boats we would like to hear from them.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF THE MODELMAKER, published monthly at New York, N. Y., for April 1, 1929.

State of New York } ss.:
County of New York }

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared W. Edmunds Spon, who, having been duly sworn according to law, deposes and says that he is the Editor and Business Manager of the Modelmaker and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations printed on the reverse side of this form, to wit:

1. That the names and addresses of the publishers, editor, managing editor, and business manager are:

Publishers, Spon & Chamberlain, 120 Liberty St., New York, N. Y. Editor, W. Edmunds Spon, 120 Liberty St., New York, N. Y. Managing Editor, none; Business Manager, W. Edmunds Spon, 120 Liberty Street, New York, N. Y.

2. The owners are Spon & Chamberlain, 120 Liberty St., New York, W. Edmunds Spon, 120 Liberty St., New York; Wm. Chamberlain, 120 Liberty St., New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner and this affiant has no reason to believe that any other person, association, or corporation, has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

W. EDMUNDS SPON,
Editor and Business Manager.

Sworn to and subscribed before me the twenty-seventh day of March, 1929.

CHARLOTTE S. GALE,
Notary Public, Kings County, New York, (My Commission expires March 31, 1930). (Seal) Kings Co. Clerks No. 252, Reg. No. 390. New York Co. Clerks No. 824, Reg. No. 0-554.

MODEL SEA SLED

With Outboard Motor

A very interesting little model has just been made by the Bathe Mfg. Co. of Phila. This is a steam driven model of a gasoline outboard motor, of the twin cylinder type with piston valve and cam mechanism to distribute the steam. It is almost frictionless and a very high speed can be obtained easily with quite a low steam pressure. The motor weighs about 16 oz. and is ⅜" bore x ¾" stroke and is built of red brass. It has neat bevel gears to drive a 1¾" two bladed propeller. A 2" dia. by 8" long alcohol fired boiler drives the motor well.

The illustration shown on the front cover of this issue of The Modelmaker shows the outboard motor set up in its glider.

This glider or sea sled is constructed partly of wood and partly of metal; the bottom is of thin corrugated copper which gives a side grip on the water and takes a high polish to reduce skin friction. The glider hull measures over all 18" long by 7" wide and 3" deep. The three units motor, boiler, hull, comprise the complete set but can be had separately or complete, steam tested and ready for the water.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 52)

Frame Braces, Motion Beam Guide Yoke

The Frame brace, only one of which is required is a simple channel section casting which only needs filing up square on faces and reducing to correct dimensions, or it may be faced in the lathe in the following manner.

Lay a piece of flat cold rolled steel on two jaws of the universal three jaw chuck, place the casting on this a piece of packing on top and screw up the jaws. Face off one edge, remove, turn round and replace with a parallel strip between face of chuck and previously faced edge.

Guide Yoke

This casting carries the guide bars and also acts as a brace between the frames. It should be carefully marked out and filed close to lines. First, file the top edge straight and flat and also edges of flanges. Lay the casting in a tool makers vise. See that it is reasonably square, if not place thin slips of packing against jaws to rectify. Now with aid of surface plate and gauge, scribe out the faces, and then clamp to angle bracket and again mark center lines, and frame faces. This is a similar operation to the marking out of cylinders. Drill holes shown on detail drawing in correct location. It will be noticed that bottom edge of side face slopes up. This should be scribed off from frame as it follows the frame contour at the location of guide yoke between them. This little operation can quite well be left till assembly.

The Motion Beam which carries the expansion link brackets is to be treated in exactly similar manner to the guide yoke, and should present no difficulty after a satisfactory guide yoke has been made. Note that the top edge and one side of overhanging portions are to be finished flat and square. Also be careful to work close to dimensions. The outer ribs will have to be filed to clear wheel later on.

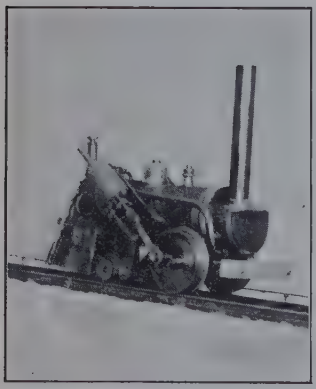
Boiler Waist Sheet Bracket

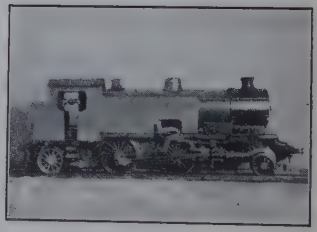
This casting can be filed up and holes drilled for screwing to top of frames. The 1/16" brass plate can be made later on from material left over after making cab deck. Therefore do not tap the holes in the casting for this plate at this stage.

The castings can now be fitted to frames in their proper position, as indicated on frame detail drawing. The motion beam is located 4⅞" between face of guide yoke and face of valve chamber.

Next month we will take the Bearing Boxes and Trucks.

(To be continued)





A MODEL RAILWAY SYSTEM 1¾" GAUGE

BY MR. C. H. ROBERTS

In a recent issue of The Modelmaker we featured a Locomotive built by one of our readers in far off New Zealand. It now gives us much pleasure to describe and illustrate some rolling stock and railway layout made by one of our readers residing in San Martin, F. C. C. A., Argentine Republic, because we feel sure that it will interest many of our readers.—[Ed.]

I am awaiting with interest the December issue of "The Modelmaker." I am afraid I cannot remember which photographs I sent you, but I will endeavor to give you a few details of the most interesting points about my railway and equipment.

TRACK—The railway track is laid on a shelf 3 feet from the floor, round the walls of a cellar, roughly 12'x10'6". The present lay-out is intended to represent a small wayside station, and can be extended.

In point of fact, however, the ends "A" and "B" are actually joined, and the bridge is removable to enable operators and spectators to enter the room. As can easily be imagined, the curves are of a rather sharp radius (40 inches), and this makes it very difficult to use scale length coaches, and engines with a long wheelbase.

All switches and signals are worked from the cabin shown, which encloses an interlocking frame of 22 levers, 17 of which operate signals, and 5 correspond to the switches.

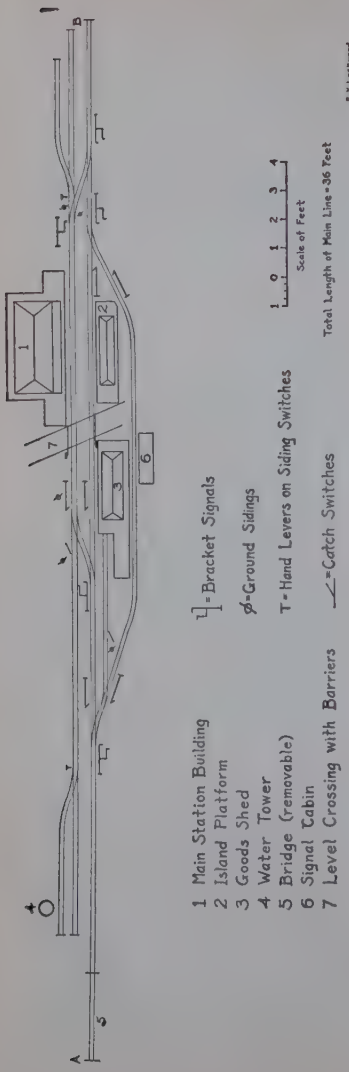
The station and signals are lighted by 3-volt electric lamps, which take their current from a small bell transformer connected to the house lighting circuit. There is also a copper conductor stretched alongside the track, taking the form of an outside third rail, for supplying electric current to lights in the passenger rolling-stock.

The running rails used are of English standard bull-head section, and are laid on chairs and wooden sleepers (ties) in the usual manner. The whole of the track is ballasted with fine granite chips.

Owing to the sharp radius of the curves, as mentioned above, it has not been found convenient to use proper frogs and guard rails for the switches, which are an elaboration of the old-style tin-plate switches for toy railways, in which the whole of the rail, from tongue to heel, is moved over. In this manner, pinching of the wheel flanges is avoided.

Our present track has grown gradually since the middle of 1921, prior to which date we had a simpler lay-out in another house.

LOCOMOTIVES — Our prize loco. is No. 1017, a "2-4-2" Tank engine, built by ourselves in 1925. This engine has two slide-valve cylinders, 5/16" bore, by



¾" stroke, and the valves are actuated by full Walschaert's valve gear (unmodified). The overall length of the engine is 16¾". The boiler is of the Smithies type, having an outer casing of 2¼" diameter, enclosing the boiler proper of 1¾" by 8", with three water tubes. The average working pressure is in the neighborhood of 80 lbs. per square inch, and we have on test made this engine lift a deadweight of 16 ounces, hung on the end of a taut cord over a pulley fixed to the end of the track, after removing the bridge.

I am at present engaged in building a tender engine of the "2-8-2" wheel arrangement, having piston valve cylinders of ½" by ⅞", with a Smithies boiler, fired by a paraffin burner. I am expecting to complete it within the next six months, working in spare time. We are hoping that this engine will beat all our previous records of weight-hauling, etc. inasmuch as it will have a large boiler and large cylinders.

Some time back, we built a small loco. on the lines of the ancient "Rocket," having a coal-fired boiler, 1¼" in diameter and 5" long, and with one cylinder ⅜" by ¾". Owing however to the fire tubes being of small diameter, the exhaust blast was insufficient to keep the fire going properly, and we sent this engine to Mr. Lawrence (L. B. S. C.) asking for his helpful criticisms. This gentleman very kindly gave us the necessary hints, and as a result of his suggestions, another "Rocket" was built, which has proved successful, with a charcoal fire.

I believe that the "Damp Squib," as we nicknamed the first "Rocket," was shown on Mr. Kennion's stand at the last

Model Engineer Exhibition in London, as a curiosity.

The remaining engines (seven in number) are not worthy of special mention. One of these is also a home-made article, and the others were purchased at various times from different trade firms. Three are steam driven, and four clockwork.

ROLLING STOCK—The freight cars are built of wood, and have been practically copied from Messrs. Bassett-Lowke's standard productions, with certain alterations so as to approach more nearly the style of cars in use in this country. Bogie frame castings were made of bearing metal, in plaster-of-Paris moulds, with wheels of the disc type turned up from brass bar.

The overall length of the larger cars is 15¾", and those of two axles are about 7" in length. We have at present six cars of two axles, and five with four-wheel bogies.

Passenger rolling stock is represented by a four-coach set of corridor cars, such as are used on the suburban lines around Buenos Aires. These cars are built of wood, and were completed towards the end of 1924. Details such as upholstered seats, electric lights, toilet compartments etc., are included. All the coaches, which are 17¾" long, are electrically lighted, with one lamp in the middle of each.

Bogie frames for these, though naturally of a different design, were cast in the same manner as were those for the freight cars. We have also built a pair of six-wheel bogies, to be used on a sleeping car of the latest design which is being made for me by a friend who is interested in fine wood-working.

SUNDRIES—A large amount of detail work has been included in the general finish of the line, such as fences, flood-lights, station with island platform, water tower and sidings. The level-crossing barriers are operated from the signal frame. The goods shed is made of corrugated copper sheeting, on a wooden frame, and is raised from the general ground level on a platform of a height to suit the floor height of the freight cars. The bridge is constructed of steel plate, riveted to brass angle, and is of the usual box girder design.

Mr. Frank Birch of Detroit, Mich., writes that he has constructed a 50 foot length of test track for locomotives, suitable for any gauge from "O" to ¾" scale. The track is suitable for steam or electric locomotives. Anyone residing within the vicinity of Detroit, can bring their locomotives to test them out without any charge. He also says he is interested in getting out some new designs for next Fall.

Mr. Chas. A. Cole of California has been appointed the Western Agent for the Wall Gasoline Engines, and is carrying them in stock. Western readers interested in one of these Engines should get in touch with Mr. Cole.

Have you sent us the renewal of your subscription? Please let us have it at an early date.

A PACIFIC TYPE LOCOMOTIVE

Built by Mr. ROBERT H. RYDER

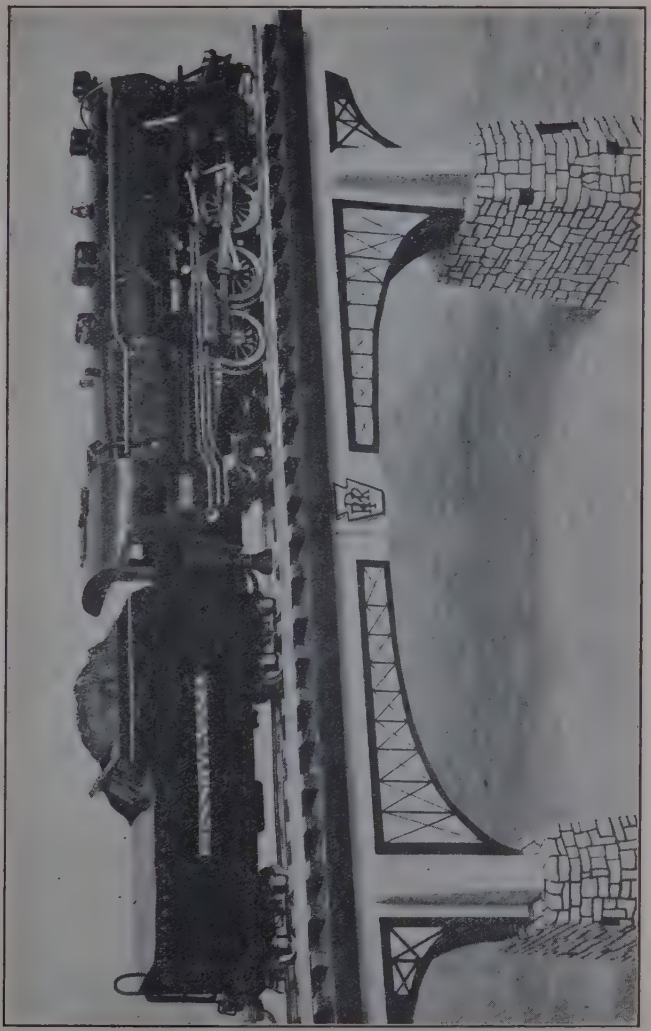
For a number of years a latent desire to build a Pennsylvania K-4 Model locomotive has been suppressed, due to a lack of funds, equipment and a suitable place in which to carry on the work.

My visit to the Baltimore and Ohio's Iron Horse Fair stimulated me to such an extent that soon afterwards drawings were made, but it was not until last February that actual construction was started.

First and foremost—my model is of metal construction and hand-made throughout. With the exception of the motor, wheels, bell, cowcatcher and the tender trucks, every piece was made up and fitted in my room at the Central Y. M. C. A., Hagerstown, Md., with a very limited amount of equipment and tools.

The model is powered by a Lionel 2¼" gauge motor. The under frame was filed from 1" strap iron (and bolted and soldered together), as were the pony and trailer truck frames.

The cylinders were made up from brass curtain pole sockets, the valve cylinders from four old brass grease cups, and the whole enclosed in a sheet-copper jacket. The saddle was formed from the same material. The smoke box and boiler jacket were formed by bending sheet copper around a large Noxema jar. The smoke box front was filed from heavy brass and a cut-down Energine can top soldered on, furnishing the correct appearance. The clean-out door is copper and the lugs are imitated by bent pieces of 1/16" square bus-bar, sweated on with solder. An old fountain pen flashlight furnished the parts for the electric headlight. Thin wall brass tube was made into a smokestack. Solder puddled on the base and worked up with a rat-tail file gave the correct appearance. The top rim is a piece of galvanized wire bent to shape—soldered on and filed flat on top. The sand dome called for more work. Sheet copper was cut and bent around a small bottle and filed to fit the curve of the boiler jacket. The top was made by crimping the edges of an oval piece of copper, setting it in and all crevices filled in with solder, which was then filed down smooth and to the correct shape. The steam dome was a cut off top of automobile dash light, filed to fit and soldered to the boiler jacket. Safety pops were made from brass distributor-head connections, filed off and soldered in place. The cab is made of sheet brass, windows being filed out. A small toggle switch controls the headlight and is located just beneath the cab roof. The injector pipes are soft brass tubing, bent to shape. Other piping shown on the engine is galvanized 10-gauge wire. The hand rails are ⅛" brass Ox-y-weld. The cross-compound air pumps are brass bushings for marble balls used on automobile gearshift lever. Air reservoirs are of sheet brass, formed over round objects. The power-reverse is a brass bolt, a short piece of copper tubing and a filed piece of



brass. Directly beneath this is the handle which operates the motor reversing switch. Couplers were filed from bar solder. Steam and air hose connections were made from telephone cord tips inserted in white capillary rubber tubing. The keystone number plate and main-rods were laid out on sheet brass, the inside part carefully filed out and then this sheet sweated on a piece of sheet copper with solder. The respective parts were then filed into the finished product. This is a very lengthy procedure—but the means to an end of obtaining the desired appearance.

The tender is black metal, built up on a strap iron frame, the whole being mounted on Ives trucks. The ladder, grab-bars and hand rails are of 10-gauge galvanized wire. The steps are of sheet copper—shaped with a pair of pliers and soldered together.

A full Walscheart valve-action was used. The reciprocating parts and rods were filed from sheet brass and aluminum.

The whole model is painted with black brushing lacquer and enough of the brass left in its natural state to add tone. The cab roof, together with the back of coal support on the tender and the center of the keystone number plate are painted the characteristic red in true Pennsylvania style.

The lettering for the model required a very round-about course. All attempts at lettering directly on the painted metal met with unsatisfactory results. Finally the letters and numbers were laid off on white cardboard and inked with India ink, using a Speedball pen. These were then photostated at our office, giving white letters on a black background. With transparent oil colors the letters were tinted yellow. When thoroughly dry the words Pennsylvania and figures were then cut out and shellaced in place on the tender and cab.

PARTICULARS

Scale, ½". Gauge, 2¼".
Length of Cylinders, 2". Bore, 1¼". Stroke, 1⅛".
Piston Valve, ¾" dia.
Walschaert Gear, complete reproduction as used on prototype.
Driving Wheels, dia. 2½".
Pony Wheels, dia. ⅞".
Trailer Wheels, dia. 1 5/16".
Wheel Base, 14 11/16" (total); 5⅜" (rigid).
Position of Motor: Set in center of frame, extending up into boiler shell.
Kind of Drive: Gear.
Approximate Speed of Engine: 35-45 scale m.p.h.
Volts and amperes required for running it: 6 volts, 3 amps. D. C., or 18 volts, 1 amp. A. C.
Length over all, 36".
Locomotive, 22".
Tender, 14".
Height above the rails, 7".
Width at cab, 5".
Weight, 12 lbs.

All drawings were made from snapshots taken at Halethorpe and as yet I have never seen blue prints of the prototype. This will account for many of the parts not being to scale.

Since recently subscribing to The Modelmaker, I have learned of many tedious tasks which might have been saved me, by using such parts as are made by Mr. E. P. Alexander, of the American Model Railway Company.

Now, however, that the model is completed, my long pent up desire is realized. Nevertheless, upon reading about and seeing pictures of such models as

Messrs. Coventry, Bray, Birch, Icken and others have constructed, mine looks rather crude. Notwithstanding, enclosed are some photographs of my first attempt at a locomotive model. The experience acquired in its construction has made me believe that my next one will be a better one.

At the present time my "spare-time" efforts are being concentrated on the construction of a 36-inch wing spread flying model of the Spirit of St. Louis. As soon as it is finished I am planning to build a Pennsylvania E-6 locomotive, using a Lionel 2¼" gauge motor.

In conclusion, may I extend my congratulations on your marvelous little publication, and as my subscription expires next month, enclosed please find check of $1.00 for my 1929 subscription.

The Model Yacht. We have before us the March issue of this splendid little Magazine. This is the fifth number published, and it certainly seems to be improving all the time. The principal articles are the "Weaver" Steering Gear; How to Build and Rig a Model Yacht; Proposal for a New Model Yacht Rating Rule; Naval Architecture for Small Boat and Model Yacht Builders; Is the Ideal Rating Rule Possible?; A Class R Model; Universal Rule, with two-page drawing of lines; With the Clubs; etc., etc. Single numbers 15 cents. Annual subscription $1.50 postpaid. Subscriptions can be sent to us. Published Monthly.

When writing for information please enclose stamped and addressed envelope for reply.

From correspondence received there seems to be some doubt as to the make of the gasoline engine described in Mr. Lockwood's articles. We wish it to be clearly understood that it is one of the well known "Wall Gas Engines" and that Mr. Lockwood is Mr. Wall's Eastern Representative. Any of our readers wishing to build one of these Engines can commence at any time. The first article describing the construction was printed in the December 1928 issue of The Modelmaker, and all the numbers containing these articles can still be obtained.

Mr. Austin W. Reynolds, Box 272, Porterville, Calif., is interested in Modelmaking, and he would like to get in touch with any of our readers in his State, with a view to an occasional meeting for mutual benefit.

The Shipmodeller for April is before us. This is the Official Journal of the Ship Modelmakers Club. It contains quite a little of interest especially an article relating to the reconstruction of the S.S. Frigate Constitution. The principal article is a North River Sloop by Capt. H. Percy Ashley, with a two-page drawing showing sail plan and some details of fittings. Last month's issue had a two-page plate giving lines. This Sloop was built in 1839 and from this description could be built a very nice Model. It also contains Club News, Correspondence, Book Reviews and some short articles. The numbers are 30 cents each. The April issue is the third number published. We can supply copies of these numbers.

THE BOSTON MODEL CLUB

The first meeting of this Club was held at 100 Summer Street, Boston, Mass. on the evening of April 2nd.

Seven members were present, and as eleven other prospects owing to previous engagements were unable to attend, those present decided to have another meeting on April the 23rd. Indications point to a large attendance at that meeting, at which the President also the Secretary will be elected.

Mr. Earl French was made provisional President and Mr. H. W. Pontin elected Secretary, pro. tem.

Progress was made, several invitations being offered to visit the members shops and homes to examine different models under construction.

The following members were present: Messrs. E. M. French, H. E. Webber, A. K. Wardwell, E. M. Devoe, P. S. Ross, R. C. Ross, and H. W. Pontin.

We hope all our readers in the intellectual state of Massachusetts will fully realize that this is their opportunity to boost the Club by joining up and in that way helping the Modelmaking fraternity.

We wish this new club Good Luck and a Successful Season.

Mr. N. G. Mauro, Callander, Ontario, Canada, writes us that he has just completed a Model of an Ocean Liner, but he does not give us the dimensions. He would very much like to get in touch with any of our readers in Canada who are interested in Model Boats, and the construction of steam engines.

The next meeting of the New York Society of Model Engineers will be held on April 23rd at 8 P. M. at 29 West 39th St., New York. Business, Election of Officers for the ensuing year.

The Editor,
The Modelmaker,

Dear Sir:

Your February issue to hand and will say that it is the best issue of "The Model Maker" yet published.

Your editorial this month is very interesting, and I believe that many model makers will agree with you. I believe that if some company would do the same thing with rolling stock. it would meet with the approval of the model maker. It would be a good time to work out the details of such a matter this spring and summer, so as to get it ready for this fall. As model work as a rule is a bit slack in the summer. It may be if you will take this matter up in your good magazine, you will get the hearty approval of the model making fraternity.

Your magazine is a very good one, but would like to see it get a bit bigger. I believe that there are enough model makers in the U. S. and Canada to support a bigger magazine. The subscription rate could be increased quite a bit more, and I don't think that anyone would kick about it. Would like to see it discussed in your magazine anyway.

Would also like to see more photos of models and their description in the Model Maker.

Wishing you the best of success.

Yours truly,

RAYMOND H. JOHNSON

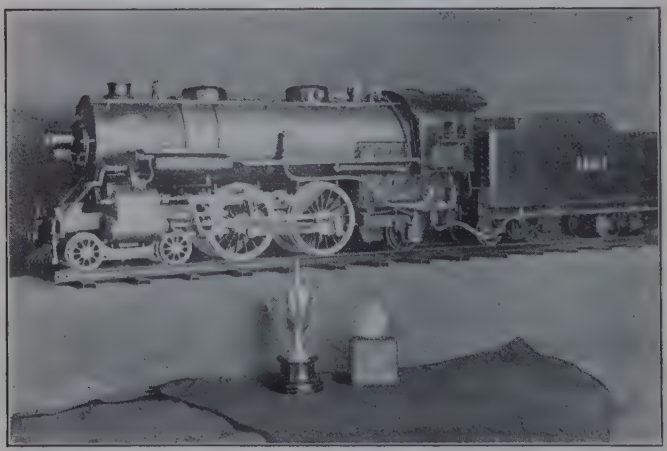
R. F. D. 1, Dix, Neb.

JOTS AND GEMS FROM THE DIARY OF A MODEL LOCOMOTIVE

READ BEFORE THE CHICAGO SOCIETY OF MODEL ENGINEERS BY MR. JOHN MATTHEWS

I have seen cartoons on "What a fly thinks about when he alights on a nice bald pate"; but I would rather not say what I thought when I first knew that "my boss" intended to take me across the ocean to the "home of model engineering." I was dismayed when I saw "the boss" stagger in with the trunk he had had made for me, but the steamship company came to my rescue by refusing to take anything as excess baggage that so much resembled a coffin. So my trunk was cut down and cut down until I just about fitted in snug and I thought the trip had begun, but it was only downtown to the U. S. Customs Appraisal office where they took down my life history. When the railway tickets were bought, again I had to be considered; for the first thing the bagage man said was "Are you taking that engine along?" He lives in our street and had seen me running in the back yard. Anyway the boss wedged me in good and tight and I began my travels, weighed, handled, and banged by I don't know how many different people, until I finally found myself on the dock at Glasgow. Here the customs was most indifferent, he never even wanted to look at me, but I was taken to the boss at the station and he saw me on the train for Kilmarnock, then changing to a little light railway that the boss called "The Toonerville Trolley" — maybe that is why the whole train shook when the porter hitched me on to the rear end of it. Next I found myself on a barrow being taken into a workshop in Darvel. There I was unpacked and examined. Lots of people came to view me but in a few days I was hauled away again, this time in the side car of a motorcycle, into a little garage where I got my picture took. Then someone wanted to "see the wheels go round," so my boss steamed up to let them see what I could do. Repacked, motorcycle side-car again, two train trips and I found myself in the great city of London (which, by the way, my boss calls "The city of his dreams"). No rest, another train trip to a suburb called Norbury, where a very disagreeable stationmaster "soaked" my boss 1 pound because I wasn't just ordinary luggage. It made me feel quite important. For the first time in my travels I was handled right side up and almost with reverence, for the boss, (with help), carried me across to a real home, the (residence) or abode of L. B. S. C., where I knew in a minute I was in the hands of an expert. He built a special track in his back yard to test me out on, and I felt very proud to hear him say to my boss when the running was over "She'll do, don't need to touch a thing," etc. etc.

My next trip was in an auto to Horticultural Hall, where I found myself only one among many more models, there being 262 all told in the competition. Cannot begin to tell you how many people looked me over during the following week, but on opening day of the exhibition after Robot, the tin wonder man had made his speech, the track was opened for business and it was never quiet and never without an engine running, from eleven in the morning till ten at night, every day. I ran for several hours each day, always pulling a load, and there was always a bunch lined up for their turn, a tidy lot of grown-up folk, too. I heard a mother grumbling one day. She said, "My children have waited nearly half an hour for a ride." They had a big black board at the back of the track and it gave me quite a thrill when I could see this: "The U. S. A. engine is now running; Mr. Matthews driving." Forgot to tell you that before I could perform at all a full report of tests (about pressure, safety valve, etc.) had to be sent in to the London County Council and my picture with the boss, was published in Reynolds Sunday Paper. On Wednesday they stuck a nice big sign on me, "AWARDED BRONZE MEDAL," and believe me, I felt very proud. I pulled my record load on Saturday night, seventeen, and won all kinds of praise, as well as the special prize of a silver cup.



The big week was over all too quickly. I was packed once again and taken by taxi to the Cunard office, there to await shipment to the docks at Southampton. It was a stormy trip back across the Atlantic and the

Statue of Liberty looked good to many. Another taxi ride and then a rest for a week in the baggage dept. until I was again dumped on a train for "home, sweet home." A few more bumps and bangs and I was back on my table again in the basement, among familiar surroundings. I travelled on all kinds of conveyances, but missed the London subway. The first day that the boss took his wife on the subway he lost her, so maybe that was why he wouldn't take a chance on me. There are many battle scars on my trunk but I escaped with only a bent running board.

It was a great time, but I join with my boss in saying "Ain't it a grand and glorious feeling to be at home again."

Some particulars of Mr. Matthews locomotive:

Atlantic type, free lance, ¾" scale.

Cylinders, 1⅛" bore by 1¾" stroke.

Walschaerts' valve gear.

Drivers, 5 inches in diameter.

Boiler, 5½ O. D. by ⅛", copper tube, rivetted and brazed throughout, and tested to 250 lbs. pressure.

Fire tubes, 20 copper, ½" O. D.

Working pressure, 90 to 120 lbs.

Superheater in smokebox.

Power feed pump, working off crankpin injector.

Hand pump in tender.

Chassis equipped with laminated springs, equalized.

Swing link leading truck.

Weight of engine, 90 lbs.

Weight of tender, 25 lbs.

No castings used except cylinders and wheels.

Mr. Adolph Bosshardt writes us that he has under construction a new model power boat hull, scaled down from the drawings of a famous speed boat, the product of a famous speed boat designer. The power plant will be one of his latest type 4-cylinder, 4-cycle gasoline engines. Overhead valves, water cooled, bore 1¼", stroke 1¼". Length of hull 52" O. A. He hopes to give us fuller particulars later. The Engine now on the test stand ready for its trials.

We have just received a copy of Mr. C. A. Cole's catalogue of Power Models, in which he features the Wall Gas Engines, stationary and marine steam engines and boilers, boiler and engine fittings, locomotives, boat fittings, metal in rod, and sheet, solders, screws, gears, taps and dies, etc. etc. It is fully illustrated and well printed. Everyone of our readers should get a copy of this interesting catalogue for his library. We wish Mr. Cole every success as he certainly seems to have a fine line of goods.

We have recently received quite a number of changes of addresses from subscribers some of whom have lost numbers of The Modelmaker in the mail owing to delay in sending us their new address. Be sure to mention your old address when sending your new address, as our mailing lists are all arranged alphabetically under states, and this helps us to quickly locate your card.

When writing for information please enclose stamped and addressed envelope for reply.

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Battleship Massachusetts, see page 54, March Modelmaker. For full particulars write G. H. Olin, Locksmith, Hotel Traymore, Atlantic City, N. J.

Drummond Lathes, Sole American Agents. The Gerold Company, 120 Liberty Street, New York.

The Woodworker, a monthly magazine covering all kinds of work from simple carpentry to furniture and cabinet making, fully illustrated, single numbers 25 cents. Annual subscription $2.00 postpaid. Spon & Chamberlain, 120 Liberty St., New York.

Woodwork Joints, how to make and where to use them. 101 pages, 178 illustrations, paper, 35 cents. Spon & Chamberlain, 120 Liberty Street, New York.

Gears and Model Supplies of every description. Catalog 10 cents. Experimenters Supply House, Box 10, Station Y, New York, N. Y.

FOR SALE

U. S. Electrical Patent Specifications, a set of 47 vols., full calf, 4to, fine condition, cost about $1,200.00. Will take $250.00. Spon, 120 Liberty St., New York.

Model Steam Engine Design. A handbook including original tables and calculations for speed, power, proportions of pumps, compound engines, and valve diagrams by R. M. de Vignier. 102 pages, 34 illustrations, price 35 cents.

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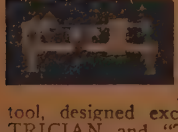

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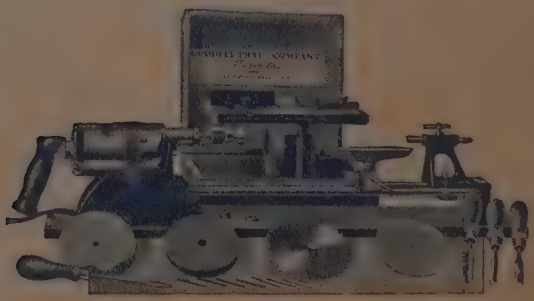

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VOL. VI, No. 5 MAY, 1929 10¢

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(See page 96)

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" #3 Commonwealth Steel Co. Type Engine Truck.
" #4 Smokebox Front—Ring, Stack, Draft Pipe (3½" diam.).

Keep this list. Other groups will follow.

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THE MODELMAKER

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Editor—W. Edmunds Spon

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Vol. VI. No. 5

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OUR FOREWORD

There is a fascination in the building of scale models of old time sailing ships, and this pastime is becoming very popular amongst business and professional men. The construction of a Model of some famous old timer that made a name for herself on the seven seas in bygone days is certainly worth the labor and time required.

While there are numerous books on this subject, a majority of them are really only illustrative and descriptive accounts of the doings of these ships, very few dealing with the constructive side of the question and those modern books that do aim to give the particulars and details of the masts and spars, standing and running rigging, and the shape and arrangement of the sails of old ships are very imperfect and often incorrect.

There is an old work by Darcy Lever entitled "The Young Sea Officers Sheet Anchor" published in the year 1819, that without doubt was one of the best books ever published on this subject. This work has been out of print for many years and copies of it are very scarce indeed.

One of our clients has a fine copy and he has arranged to supply complete photostat sets of the text and plates to any ship model builder who would be interested.

We have just seen one of these photostat sets nicely bound in cloth and this reproduction was excellent and for all intents and purposes equally as valuable as the original for those seeking information on this subject.

This work was considered the standard text-book on "MASTING AND RIGGING" in its day for young officers in the mercantile marine, as it was part of their training to make themselves thoroughly familiar with this work.

It does not deal with the construction of the hull, but illustrates and explains in detail, blocks, fitting, ropes, masts, spars and sails, advancing in progressive stages until the work is completed.

To anyone taking up the hobby of Model Ship Building this work will be found a veritable gold mine of reliable and authentic information.

We have frequently had requests for such information, so we have arranged to supply sets to any of our readers as announced in another part of this issue.

PHOTOGRAPHING MODELS

BY MR. H. W. PONTIN

After putting in much time and labor on a model, it is only fair to do it full justice, by making a good photograph. A few hints on the subject may assist readers of the Modelmaker to preserve their skill faithfully with a good picture. If the camera to be used is a plate camera, the use of double backed plates is best, as halation is reduced to a minimum. Whether film or plates, use a normal speed, around 350 or 400 H&D. The background plays an important part in the making of the picture. The best background of course is the open air, but where the model has to be photographed indoors, the selection of a sheet of grey or cream colored cardboard will enhance the detail of the model, without giving the undesirable "soot and whitewash" effect, caused by excessive contrast. Place the camera so that the plate is entirely filled by the model, being careful to eliminate all unnecessary detail not part of the picture. Sometimes when making an interior picture, where the light is brighter on one side, the use of a white sheet, so placed to act as a reflector on the dull side, will provide even lighting throughout. With the average camera the exposure should be from one-fifth second to one second for outdoor exposures, while for time exposures, as when the model is photographed indoors, the exposure should run from four seconds and up, depending on the light available. The stop to be used in each case, should be governed by the light, but generally about F/8 or thereabouts will give excellent definition. But focus sharply on full opening before stopping down. If the model to be photographed is a locomotive, the rods should be set on the bottom quarter, this not only enhances the appearance of the engine but also shows up to advantage all details of the valve gear, etc. Glossy paint finish tends to produce halation, and hides by reflection, much delicate detail and contour, therefore the model should be photographed when the priming coat has been applied. If you develop the plate or film, use a good formula, that will stand dilution. The amount of dilution to be governed by lighting conditions, and the exposure given. This will give a negative full of detail, and lacking the excessive contrast that does much to obliterate the fine contours, and detail of the model. Lack of space does not permit further discussion, but I shall be pleased to render any suggestions, as well as giving some good developing formulae to any reader who is keen on having the picture of his handiwork, at least give a good idea of the work he has accomplished.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 65)

Bearings, Engine Truck & Trailer Truck

The main bearings are cast brass in form as Fig. 27. One and a half bars will be needed. If you have a milling machine or attachment mill faces a.a.a square and parallel ¾" side to side. If you cannot mill them, it is best to saw up the bar into pieces on lines bb and treat each one separately with the file. Take two bearings and cramp together on Fig. 28. Now mill or file out the gap c.c.c. 9/16" wide and 9/16" deep. Do this to all six and then fit blocks of brass 9/16"x⅝". Solder in with a good fillet of solder as shown at "d" Fig. 29. Face off the top "e" to dimension, and the bearings are ready for boring. To do this first make a simple jig as Fig. 30 made of a piece of cold rolled steel say ¼" thick. Lay off three equi-distant points and drill for ¼" reamed holes. Mark side R. & L. Now take the frames apart, slip the bearings in place and wedge tight with a small wooden wedge driven against binder. Lay the two frames together in line as Fig. 31 getting them square and true, put in pins through three or four available holes, and clamp at each end. Mark off a line on main driver bearing which is the center one, 7⅞" from cylinder center. Center punch exactly on intersection of this line and joint of "keep" or cellar. Drill with center drill and follow with ¼" drill.

Now lay the jig on and put a ¼" drill rod pin through jig and main bearing. Set the jig parallel to top rail of frames and inspection will show whether the other bearings are correctly located in a vertical position. If they are not, readjust the wedges. Run the ¼" drill through, take off jig, number all bearings, and open out with ½" counterbone, Fig. 32. Drill for keeper pin and oil hole and then push on a ½" mandrel, not too hard or you will drive out the keeper. Face off both sides in the lathe, trim off the bottom of keeper thus cleaning away the solder and freeing the keeper.

The engine truck bearings are made from brass bar ½"x⅜", the faces being milled or filed and holes drilled and reamed. This may be done either in pairs or all four in one piece of stock, see Fig. 33, finally cutting each bearing off and filing up top and bottom.

Trailer truck bearings are treated similarly but first file inner face and side square with each other. The marking out can then be done from the two faces.

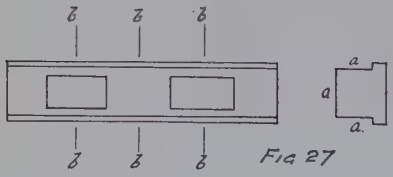


Fig 27

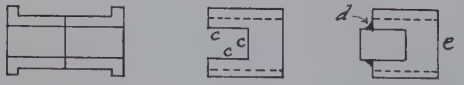


Fig 28

Fig. 29.

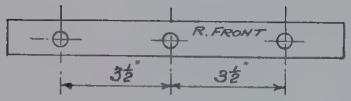


Fig 30

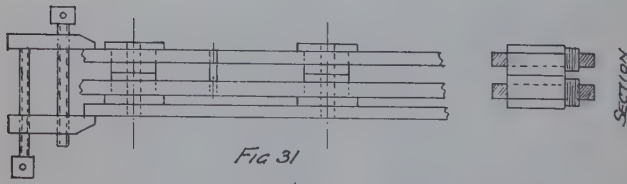


Fig 31

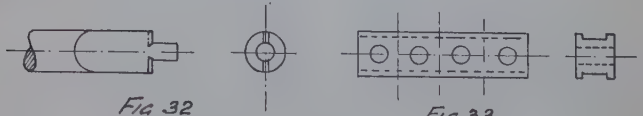


Fig 32

Fig 33.

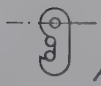


Fig 34

Engine Truck Frame—This is a one piece casting similar to Commonwealth Steel Co's design. First file up smooth the facing, against which the bolster bears. Then lay the casting down on a surface plate. (You will need a strip of ¼" parallel packing under it). Then lay off center line of axles and pedestal depths and binder edges. Then file up the binder edges close to the scribed lines. Now clamp the frame to an angle bracket, set up on surface plate and mark out axle centers and pedestal openings. Drill, hack saw and files will finish the pedestals. Work close to scribed lines and when nearly down, try in the bearings, ease down the pedestal to a nice fit on bearings.

The bolster needs drilling for "king" pin and filing up to a sliding fit in frame, the other surfaces can now be turned by mounting the casting on a ¼" mandrel. Similar remarks will apply to center plate in which a mild steel king pin is rivetted.

The equalizers are made of 1/16" thick rolled steel which is drilled, sawed and filed to shape. Pin all four together and finish file together so they are all the same. Spring hangers

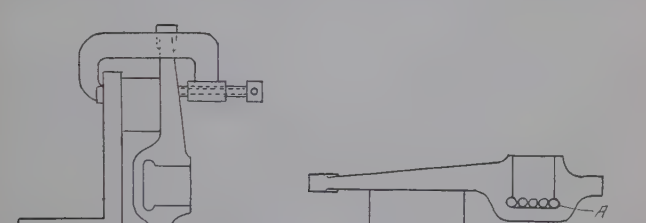


Fig 35

are cut from solid steel 3/16" square. Drill two #44 holes and cut out to form the hook.

Trailer Truck—This is an aluminum casting and the best file to use is that known as "Vixen." This has a very coarse curved tooth that cuts exactly the same kind of chip as a milling cutter. These files are excellent for working aluminum as the surface produced is smooth and this file does not "pin" to cause scoring as ordinary files do, on this material. Only light pressure is needed and they are very rapid in action.

If you use ordinary files the use of kerosene will reduce tendency to score.

First, clean up the flat top side of frame and from this face do all marking out. First all horizontal points, then vertical points by clamping frame to an angle bracket, Fig. 35. Drill holes in corners at top of pedestals, also along the top edge "A" Fig. 35.

Take two saw cuts down and saw out the fins between the holes with a jewellers or fret

saw. This will remove the piece. Finish with file to fit the bearings.

A slot must be cut out across top of pedestal through which the spring passes. It will also be noticed that there are two ¼" holes drilled each side of pedestals. These holes are for spring hanger clearance. Drill these first, from the bottom upwards as this is easier than attempting to start drill on the curved surface of top. Then saw down (two cuts) for 13/16" drill ¼" hole horizontally and the piece will fall out. Finish up with file. Drill and tap all other holes as required, fit binders and lay by till wheels and axles are ready.

Next month Wheels and Axles will be described.

(To be continued)

It gave us great pleasure the other day to have our old friend Mr. G. B. Douglas breeze into our office looking hale and hearty, having fully recovered from his recent accident, when he slipped on the ice and broke an arm. He is back on the job again full of pep and ready to build more models of ships, or supply any of our readers with blue prints of lines and sail plans of old time sailing ships from his fine collection. He looks as if he had taken on a new lease on life after his enforced rest, and we hope he will be with us and the Boys for many years to come.

Owing to unexpected delays Mr. Lockwood's final article on the Wall Gasoline Engine will not be published until the June issue.

When writing for information please enclose stamped and addressed envelope for reply.

THE BOSTON MODEL CLUB BOSTON, MASSACHUSETTS

The adjourned meeting for the formation of this Club was held on April 24th with a large and enthusiastic gathering of Modelmakers present.

The following Members were elected the Officers for the current year:

President—Mr. Earl Moulton French.

Vice-President—Mr. Harry E. Webber.

Treasurer—Mr. Gerald Cusick.

Secretary—Mr. H. W. Pontin, 82 Raymond Street, Allston, Mass.

Much was accomplished including the drafting of the By-Laws, and other important business.

The next meeting will be on May 7th. For full particulars and for application blank for membership write to the Secretary, who will be glad to give any information about this Club.

Mr. Donald Umphrey, Sigma Phi Epsilon, Corvallis, Oregon, writes us he is building an eight cylinder, four cycle V type Gasoline Engine, 1¼" bore by 1½" stroke, and would like to get in touch with some of our readers who have had experience in building such a type of Model. We feel sure that some of our readers would be willing to give this gentleman practical suggestions.

The next meeting of the New York Society of Model Engineers will be held on May 28th at 8 P. M. at the Engineering Societies Building, 29 West 39th Street, New York, N. Y. Modelmakers visiting New York will be welcomed.

TO O-GAUGE MODEL RAILWAYISTS

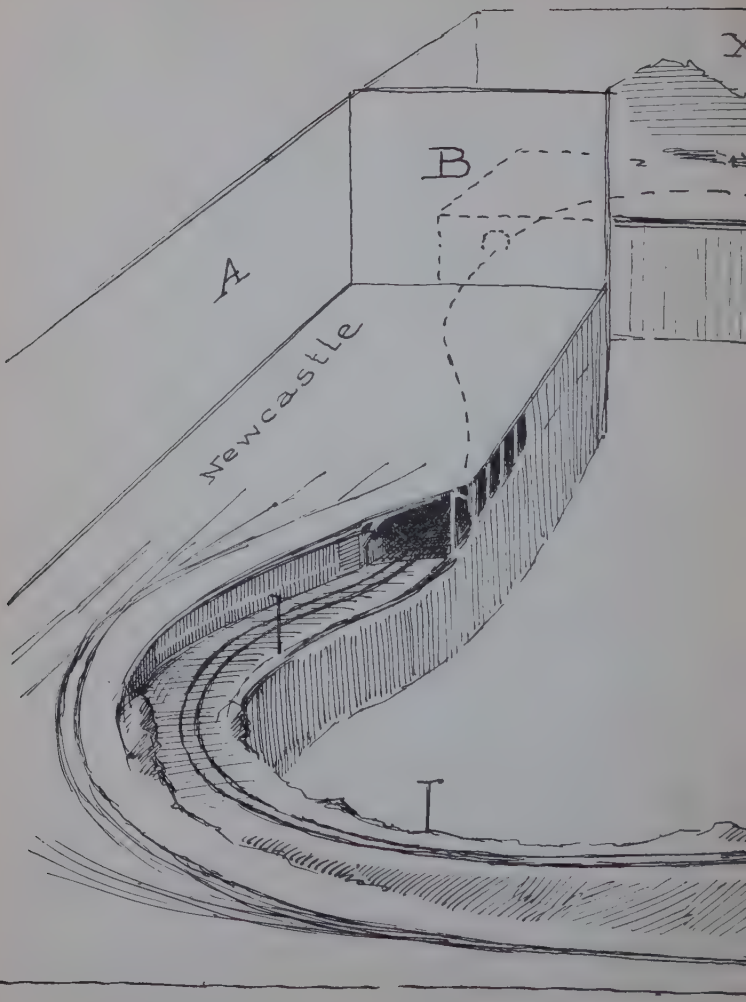
By MR. F. M. DE RIPPERA.

Although mostly interested in working steam model locomotives, I have not been able to resist the fascinating charm emanating from an elaborate model railroad.

Well-known among my friends as an incurable railway fanatic, I was asked a few years ago to help one of them with the layout of an O-Gauge electric railroad in the attic of his house. Being very busy at that time trying to diagnose a recalcitrant back-gear of my first attempt, a ¾ in. Scale crossing between a Baltimore and Ohio 2-10-2 Class S-1-A and a Pennsylvania Decapod Class I-1s, which all model-loco-men's big brother "L. B. S. C." in London would not hesitate to call a nightmare, my "valuable" help consisted in a few catalogues and all the issues of "The Model Railway News."

I did not hear from him for quite a long time, but wishing to see the result of his efforts, I called up last week. He did not talk model railway until quite late, and I was surprised to notice that it was not with the boyish enthusiasm of ye goode olde dayes. He showed me up to the attic which lay in the dark, the only lights being the numerous signal and point lamps and the 10 lamps of a very handsome Terminus. "Now sit down and wait for the Limited Express which will turn up in a few minutes" he said, and disappeared in the direction of the opposite end of the attic where the train mentioned was standing. I sat down, holding my head on a level with the track, and while waiting, I began to feel the atmosphere of nervousness that always precedes the arrival of an important train. A few minutes later the Limited Express slowly entered the Terminal while a smoke device of the builder's own invention (he is a chemical engineer) blew volumes of smoke out of the smokestack with a "scale noise" similar to the one made by an open blower, raising the realism to its climax. It was a handsome train: a baggage car, three corridor cars and a Pullman hauled by a huge Pacific with full Heusinger valve-gear and all external fittings.

I was full of admiration and asked him to switch on the light so that I could see the whole system. He did it unwillingly and I soon understood why. He had built his railroad from the wrong end i.e. the large Terminal and the de Luxe train, thus losing progressively all energy to build the less interesting items such as freight locomotives and cars, switching locomotives and so forth. I had a look at his roundhouse, a very realistic building which unfortunately only contained more or less good looking commercial engines. The turntable (Bavarian make) was too short for the Pacific which, in fact, was the only locomotive he had built himself. The surroundings of the Terminal were beyond all criticism but the rest of the system bore witness of the builder's dying interest for the work.


A
B
Newcastle

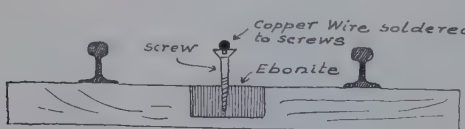
F.M. de Ripperda.
1929.

I did not give him my opinion about the line, but decided to write some notes about what I think of this interesting problem, and how I should make a happy work of a life time out of small means and a large attic.

While the miniature locomotive constructor is bound to follow closely the outlines and dimensions of the prototype, the model railway engineer can either model a section of an existing line and thus work on the same basis as the model-loco-man, or build a line of his own, inspiring himself from various railroads.

Although I agree that the sight of a model Broadway Limited at full speed over a miniature Susquehanna Bridge must make the heart of the most cold-blooded model engineer beat faster, the model railroad built from its alpha to omega strictly according to actual practice, will change an ordinary evening and Sunday pastime into a hobby that any man can be proud of.

Imagine yourself that during a recent motortrip through Colorado a great business friend of yours had heard that rich coal layers have been found northwest of Newcastle (for example). Let us call the spot X. He was too late to buy up land but in good time to get the con-



Distance between screws: 5in to 7in

cession for a railroad from Newcastle to X.

After a few conferences with the business man mentioned, in casu a good friend or a brother who sticks quite as tight to the Model R. R. question as yourself, it was decided to build the line. The annual costs must not exceed ..... Dollars (this is very important). The motive power will be marked with a narrow brass belt round the smokestack.

This a rough sketch of a very simple lay-out which will be suitable for the present purpose, namely a single track line thru a rocky country, which can be adapted to large attics as well as to smaller rooms. The sketch shows a lay-out in a room which I should think is about one third of the attic mentioned in my foreword. I insist upon the choice of a rocky scenery as it makes it possible to build the track on two levels in such a way that large portions of one of them are invisible from the other.

After having finished the substructure, build up the scenery. Rockery is easely made out of wet brown and grey paper coated with thin glue to preserve the stiffness. Other details of the landscape can be made according to the numerous descriptions in the English "Model Railway News." No track-laying before the whole scenery is finished.

(To be continued)

"O" GAUGE MODEL LOCOMOTIVES MOTIVE POWER

By MR. F. W. ICKEN

Motive Power is the subject of prime importance when considering any form of transportation. The same thing holds true when it comes to model railroad work. Yet, the average model railroad operator has had to use toy mechanisms as a source of power or go to the other extreme of using scale models, which either consumed much time in building or, if purchased ready built, were expensive.

Where a man is interested in a certain locomotive, he does not begrudge the time necessary to construct a scale model of the prototype. When it comes to the larger scales, such as half-inch, several excellent sets of castings are offered.

But for the man interested in 'O' gauge, either ¼" or 7mm scale, or in electrically driven models of the larger scales, no real parts have ever been offered other than some small fittings to be built up around standard Toy mechanisms.

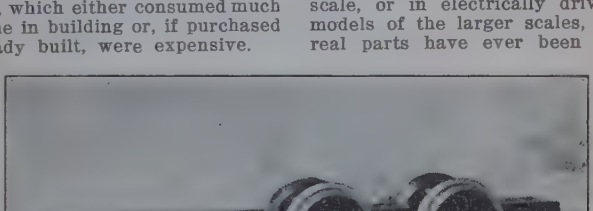


Fig. 1.

Some scale models have been offered at very popular prices, but they have not been so successful because only so much can be given for every dollar, and if the 'scale appearance' cost very much to produce, then the mechanical efficiency suffered.

The writer believes that the time has arrived when the man using either 'O' gauge or the larger scale electrically driven equipment, has a right to expect decent proper working model locomotives, that are efficient and durable. They must represent their respective prototypes as nearly as possible but at the same time, not suffer mechanically through trying to maintain 'scale.' They must be soundly constructed, and incorporate any features recently developed that will increase their efficiency. Designs must be worked out so that the costs are attractive to the average man, and possession not limited to the few.

The writer offers these new ideas, and intends to describe and illustrate them, to show what really can be done along the lines listed above. These models are intended for the man preferring electricity as a mo-

tive power for his railroad. Both steam outline and true electric types will be covered.

A special electric motor has been developed for powering these models. The quality is the best possible, and its performance is a revelation to the man who has had to use the old 'three pole armature' toy motor. These new motors have seven pole armatures, so that they will continue to 'turn over' even when loaded down to the limit. The same difference as between a four-cylinder and an eight cylinder gasoline motor. This means that your locomotive will handle smoothly at any practical working speed, and not have to be operated at a high power or speed so that the motor won't 'stall.' All working parts are built to accurate limits insuring a long life.

There are other various new ideas and parts incorporated in these locomotives which will be

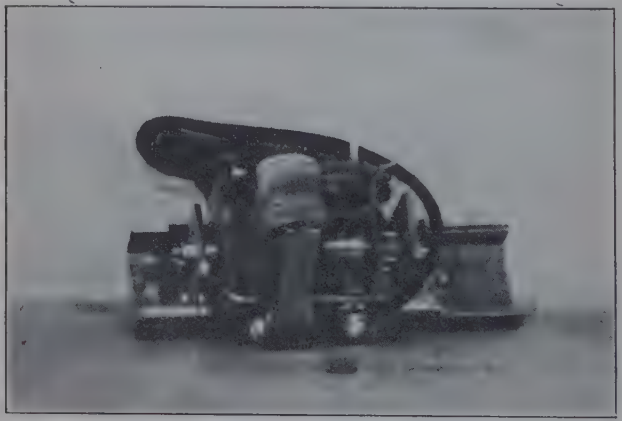


Fig. 2.

described at the proper time.

The design of all these model locomotives has been carried out so that finished parts or units would be provided, in order to make it easy for a man to assemble his own model. At the same time, the parts can be incorporated in other models being constructed to an individual design.

All the parts or units to be described, are finished complete and ready to install. No machine work of any kind is required, a complete locomotive can be built up using a screw driver as the main tool. Frames, wheels, and cylinders are painted. All other parts are unpainted, unless specially specified.

The first model to be described is an 'American' type having the 4-4-0 wheelbase, as used on the Philadelphia & Reading. These particular locomotives have always been a favorite with the writer because they make a very imposing appearance for a small loco. They have many features especially suited for adapting them to mod-

el work. They can be reproduced in model form, so that a real practical electric motor driving through a strong transmission, can be installed. There are no toy parts used in this design.

Fig. 1 shows the basic foundation of any of these designs; viz, the main frames with driving wheels and axles mounted in place. The frame is fitted with an equalizer system, so that the driving wheelbase can 'rock' with any irregularities in the track, the same as the full size loco. The frame is rigid and carries the entire superstructure of the locomotive. Nothing is allowed to 'hang over' at either end. Frame material is 3/32" thick and the axle bearings are 3/16" by 3/32" long. A master gear is mounted on rear axle so that it can mesh with a drive gear in transmission.

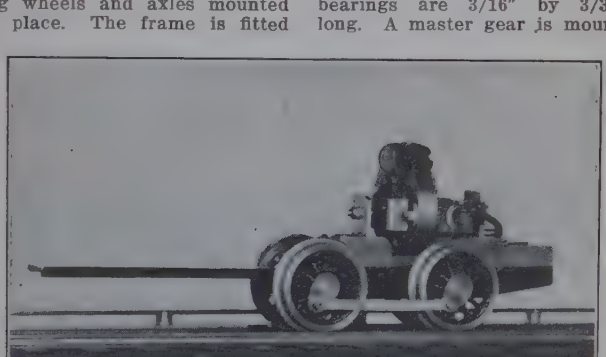


Fig. 3.

The transmission is a separate unit, fastened to the frame over the rear axle. The motor is mounted in the transmission so that it can be removed as a unit or separately. Fig. 2 shows the motor and transmission ready for installing on the frame. Only a screw driver is needed to fasten these units together. The transmission gears are machine cut from brass. The bearings are brass and of substantial sizes so that they should give long wear.

Fig. 3 shows all these units assembled ready for adding the cylinders, valve gear, pilot and leading truck. The next article will describe the assembly of these parts.

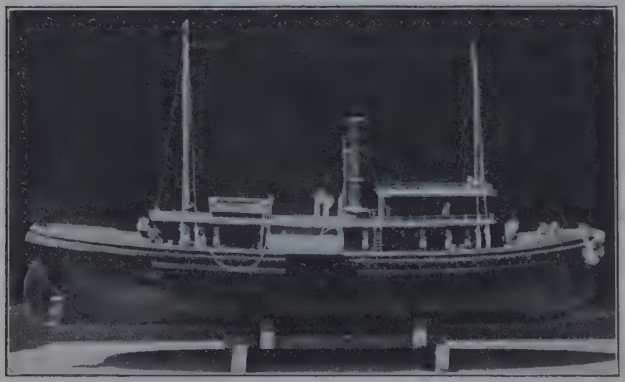
The writer has a definite plan laid out to cover certain models, but he would appreciate hearing from his readers should they have any suggestions to offer.

(To be continued.)

MODEL MAKING IN SCHOOL

MR. EDWARD YEOMANS

It will not be out of place for a person in the school business as I am, to call the attention of your readers to a side of manual training in schools that is generally either neglected or badly managed. In my experience there is nothing so fascinating to both boys and girls in either elementary or high school as model making. In the first place, not near enough time is allowed for manual arts; the text books and recitations take almost all the time that can be spared from playground. But even with the limited time allowed, a great deal more could be accomplished in securing a permanent love and skill in handwork than is the case now if the subjects were more interesting. In my school we have had two eighty minute periods a week for ev-



erybody—boys and girls alike, above the fourth grade. And in addition to clay work, weaving, and basketry, we made models of boats, cars, windmills, stage coaches, covered wagons, houses, etc. But boats are always the most popular subjects and I send some pictures of boats we have made and call special attention to the ocean going tug "Conestoga" made from drawings by Douglas by a thirteen-year-old boy. We have made several of these besides many caravels, Chinese junks, small clipper ships, whale boats and medieval ships of one sort or another.

The thing is to get drawings and have the proportions right and put in as many details as you can considering the age of the pupil. Also do a good job of painting.

This tug has a dry battery cell

in it and a small motor which drives the propeller—(a Bathe propeller and tube).

Girls must not be excluded from this model making—they are just as good at it as boys and love it just as much.

I suggest that model makers who like children get into the school game. They would have a grand time and do a lot of good, and get as high a salary as any teacher can.

Most of the "manual training" in school is dropped after school days have passed, and yet nothing is more valuable a part of family life than a father or mother who can make things for their children and particularly with their children.

We forget that these boys and girls will be parents in ten years or more and then these skills will prove of immense value in making home interesting and happy.

Every home should have a little space for a shop and the necessary tools—where the things learned in school can be carried on out of school and not confined to school hours at all. It is my hope that some day the only "home work" will be hand work and music and that all the algebras, arithmetics, histories, Latin, etc., will stay at school and not be allowed to interrupt home life as they do now. That will be a great day for both children and parents.

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Pratt & Whitney 0-80 Taps—$1.65 per doz. postpaid, a limited supply; also Vertical and Horizontal Engines for Boats and Models, Photos 10 cents. Model machine work done. Bray, 35 Summit Ave., Jersey City, N. J.

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Blue Prints of Ships — For Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

FOR SALE.

Blueprints—Design for—Scale Model of Twin-Screw Yacht. 1 Profile and deck plan, size 13" x 22" 2. Lines, three views, 7½" x 23". 2 sheets price $1.25 post paid. Spon, 120 Liberty St., New York.

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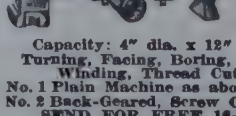

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VOL. VI, No. 6 JUNE, 1929 10¢

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(See page 108)

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Vol. VI, No. 6

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OUR FOREWORD

One of the most important events in the American Model-making World will be staged this month in Washington, D. C.

The Elimination Races under the supervision of the American Yacht Racing Association of America for the selection of the best Yacht to represent the U. S. in the International Model Yacht Races for the "Yachting Monthly" Cup to be sailed at Gosport, England, on August 3rd, 4th, and 5th, 1929.

The Elimination Races will be sailed on the Lincoln Memorial Reflecting Pond, at Washington, D. C., on June 15th, 16th and 17th, 1929.

Every yacht must be designed, built, owned and sailed by persons of American nationality, and must come within the measurements and rating of the International Model A Class.

All Yachts must be registered by Clubs affiliated with the Model Yacht Racing Association, or Associate Members thereof, but not members of such Clubs, and no Club or Associate Member will be allowed to make more than two entries.

From present indications there will be about fifteen Yachts entered representing about ten Clubs located in different parts of the States. Constituting the largest and most comprehensive Regatta yet held for this series of races.

While there are many new Yachts this year, little information about them has been forthcoming, as their builders and owners have been very reticent about giving out any reliable data, but from present information model yachtsmen are looking forward to some very fine sailing and many surprises.

Last year Mr. J. A. Weaver, Jr., represented the U. S., sailing Mr. A. B. Reynolds "Patsy" and just missed lifting the Cup by the smallest margin.

It was no fault of Skipper Weaver that he did not return with the coveted prize.

Perhaps it was really the best thing that could have happened to our Model Yachtsmen. They just set to work with greater enthusiasm and determination to produce something finer and better than their previous efforts, and we are all anxiously awaiting the results of the forthcoming Races, in the anticipation that the Yacht selected at Washington this year, will also prove the prize winner at Gosport.

THE CHICAGO MODEL EXHIBIT

MR. S. C. SWANSON

The Eleventh Annual Exhibition of Models, tools, etc., by the Chicago Society of Model Engineers was held on December 5, 6, 7 and 8th in Room 1032, Republic Building. Compared with previous efforts of the Chicago Society this exhibit showed considerable advance over its predecessors. The attendance was all that could be desired considering that less than two weeks were available for preparations. Mr. Fox prepared a poster tracing and blue line prints were distributed about the city. Notices and photographs were sent to all the newspapers, resulting in a splendid writeup in the Chicago Daily News. The attendance was pretty well distributed throughout the four days and nights that the exhibit was open.

Much credit for the success of the exhibit goes to Mr. Hayward, whose negotiations with the building managers made the exhibit possible.

There was a noticeable increase in the number of boat exhibits particularly, which included yachts, speedboats, old-time and modern vessels. Among the new exhibits one prize model was included, a replica of the famous clipper ship "Flying Cloud," by L. J. Pitcher. This model won a medal and cash in a model competition conducted by "Popular Mechanics Magazine" last year.

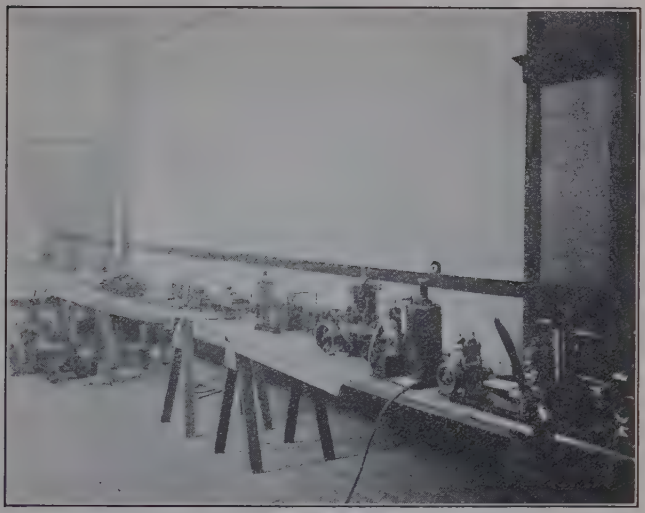
Among the steam models, besides the perennials there were some that had not been on view for several years. John Baurs precision model ½ inch scale German type Atlantic locomotive and ¾x1¼x1¾x1 inch bore triple expansion engine were two of this class.

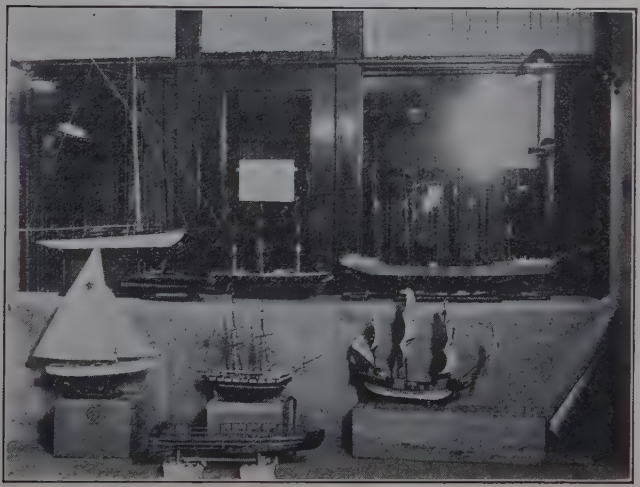
John Matthews' group of steam models was augmented this year by the ¾ inch scale model Atlantic with which he pulled 16 passengers and the driver at the "Model Engineer" Exhibition in London last September, and won a bronze medal and silver cup. Another newcomer in the steam group was a model of Richard Trivethick's locomotive of 1804, made by E. L. Hayward.

Elmer Wall represented the gasoline engine group with several single and two-cylinder, two and four-cycle gasoline engines.

Among the visitors to the exhibition who joined the society was Dr. O. J. Troje of Birmingham. Dr. Troje came to Chicago to attend a Radiological Convention, but was with the model engineers nearly every night of the show. That is the way the model engineering "bug" works when it bites, and it has just about the same effect on the old members, especially at exhibition time.

If there are any lone workers in or near Chicago, or any other part of the country (for we have a number of non-resident members) who have not yet heard of our club they may obtain applications for membership from the secretary, S. C. Swanson, 5510 W. 64th St., Chicago, Ill. A cordial invitation is extended to all who can attend any of our meetings which are held on the second and fourth Thursdays in each month, in Room 921, Kimball Hall.





"O" GAUGE MODEL LOCOMOTIVES MOTIVE POWER

By MR. F. W. ICKEN

(Continued from page 95)

Last month we covered the "Foundation Unit" for the model P. & R. "American" type locomotive. Though not mentioned in the last article, a pair of third rail shoes and a controller are included in this unit. An extra length of wire is attached to the third rail shoes, for connecting to the locomotive headlight.

It has been decided that the "Foundation Unit" should be supplied assembled complete, as illustrated in Fig. 3 of last month. This assures a builder of having all the main electrical and mechanical units in proper adjustment. Separate units or parts could still be obtained for installation in other models.

Starting with a finished "Foundation Unit", we will now continue the building by adding the cylinders. Cylinders are finished complete with cross heads and connecting rods. They are secured in position by passing a long stud up through the frame, then through the hole in the cylinder block. A nut is threaded down stud from the top, locking this assembly in position. The Big Ends of the Connecting rods are then slipped over the leading crank pins. A small washer is provided for placing between the coupling and connecting rods.

The Valve Gear is assembled, attached to the supporting frame. The installation is as follows; viz, first lay the entire valve gear over or astride the frame, using the supporting frame as a 'center.' Make sure that the 'piston rods' are at the cylinder end and that the eccentric cranks are at the wheel end. Then insert the 'piston valves' in their proper position, after which the small link at the extreme bottom of the valve assembly can be connected with the arm projecting from the bottom of the cross head. The connection is made here by means of a small screw and lock nut. Then the eccentric rods with their cranks are brought back to the leading crank pin. With the crank pin at 'bottom center,' the eccentric crank should be placed on the pin, standing vertical and then turned toward the front of the loco until the small 'flat' on the crank pin is lined up with the small 'flat' in the eccentric crank hole. A screw is driven in from the front locking the crank in position on the crank pin. When all these connections are made, then the frame supporting the valve gear should be fastened in position. Two small screws are provided with the valve gear and the holes in the frame are drilled and tapped. Make sure there is no 'tightness' or bind of any kind before proceeding any further.

The Pilot, Pilot Beam and leading Deck Plate are assembled as one unit and are fastened in position by means of two screws passing down through the deck plate into the frame. Two boiler stays are also included in this assembly.

The Leading Truck is next. This is attached to the frame by means of a stud passing through a slot in the truck and frame and screwing into a hole in the

frame. A small coil spring is placed between the top of the truck and the underside of the frame. A small flat spring is attached to front of truck and should be adjusted so that when the chassis is placed on the rails, this spring just touches the underside of the frame. Do not have this spring too high or it will have a tendency to 'lift' the front end of the loco.

The final parts to add are the small Air Tanks. These are carried on the chassis frame, right behind the cylinders. Two holes are tapped in the frame for the two long screws which pass down through the tanks. A small piece of plate can be pushed into position between the two tanks, if the 'stay plate' appearance is wanted.

This now completes the chassis. It should be gone over for a careful 'tightening up' and adjusting. The illustration shows the chassis complete, with the 'Ash Pans' in position ready for placing the Boiler and the Cab.

These units will be described next.

The writer wishes to thank the many readers who have written him giving suggestions. They are all appreciated very much, as it is only in this manner that articles and materials can be developed that will be of the greatest possible assistance to model locomotive builders.

(To be continued)

THE BOSTON MODEL CLUB

Boston, Mass.

Mr. H. W. Pontin reports that the meeting of this Club on May the 21st was a great success. Many new members from various parts of the State were enrolled and a number of prospects were heard from. The men present settled down in earnest to get really acquainted with each other and great things are looked for from the Members of this new organization.

The next meeting was scheduled for June 4th at the home of Mr. H. A. Austin, who had promised to demonstrate his ¾" scale Locomotive. It is hoped to continue the Club Meetings until August ere they close for the season.

Any of our Massachusetts readers who have not been present at one of these meetings or written to Mr. H. W. Pontin for full particulars of membership should do so at once. His address is 82 Raymond Street, Allston, Mass.

As so many Modelmakers have joined this Club, the Membership List will be closed at the next meeting June 18th, after which time the annual dues will be increased and an initiation fee will be added. Therefore be sure to join at the next meeting.

A MODEL OF THE ENGLISH DESTROYER "SWIFT"

BUILT BY MR. M. A. COOPER

During the first years of the World War, Destroyers attracted a great deal of attention. This was especially true of the English Flotilla Leader, HMS Swift. At this time, I attempted to build a model of this ship from plans in the Encyclopedia Brittanica, which plans proved most inaccurate and necessitated the scaling down of photographs, both for details and dimensions. Incidentally this is a most unsatisfactory method, and I advise no one to try it.

The model is sixty inches long, by six inches beam, or one seventieth of the original. The moulded depth is about four and three-quarter inches. Since the sides of this destroyer from the curve of the bilges up to the deck are very nearly straight, it seemed possible to make the deck of a thin board, and the bottom of a two-inch board, carved inside and out to the desired shape. The side plating was then put on, of thin sheet zinc, which can be drawn slightly if desired, and is very easy to work. The main deck was continued to the bow, and the forecastle deck of thin board was cut to overhang the main deck slightly, thus giving the characteristic flare at the bow.

It was intended to rivet all the deck fittings together, as in the ship itself. This proved so very slow, that after the funnels and a few hatches were completed, the soldering iron was used.

The Model was originally driven by a six-volt storage battery made by cutting down three cells of an old Dodge battery, and a motor from an automobile horn. This gave a speed of between six and seven miles, in the water. The battery also furnished current for the searchlight, on the bridge and a tiny masthead light.

Since the War, I have rebuilt this model, from very incomplete information obtained from "Fighting Ships", and other sources. Since there is little opportunity of putting it in the water now, the Motor has been removed, and small electric lights put in the hold, etc., so that when these are connected to the light circuit, the port holes are lit up.

While the original Swift is now obsolete, she has never been equaled in size (as far as I know). The modern British Flotilla Leaders, while smaller ships, surpass her in gun power, which, of course, is everything. This was very clearly shown in the Swift's fight in the English Channel, when she, and the Broke sunk, or put to flight five Enemy Destroyers, who greatly exceeded these two destroyers, both in total tonnage, and number of guns, but whose guns were of lighter caliber.

I should like to get in touch with others who are interested in building warship models. To me, they are far more interesting, and worth the trouble and work necessary than models of obsolete ships.

Have you all the back numbers of The Modelmaker? If not what do you lack?

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 88)

Wheels & Axles—The actual method adapted for turning wheels will depend upon the size of chucks and face plates available. Two methods will be given, that will meet practically all cases.

Taking the trailer truck wheels first. Turn up a piece of stock of thickness 1/16" less than step of chuck jaw, and of diameter say ⅛" less than rough casting flange. A thick washer, disc or even pieces of pipe make good spacers. Slip the spacer in the jaws and grip the wheel by the flange, gently tapping the wheel against the spacer while tightening up the chuck. Now set the tool post slide 3 degrees to lathe centers. Use a tool ground with front and side clearance and top rake, and feed up with saddle and cross slide, not the tool post slide. The operations are now as follows:

(1) Face off hub by an amount that will leave sufficient to come off flange. Find this by measuring up the rough casting.

(2) Face off wheel side face 1/32" back from the hub.

(3) Turn tread to 2" diameter (using the saddle for feed) and ¼" wide. This will bring the tool very close to chuck jaws so be careful.

(4) Bring the tool back about 3/32" from flange by shifting the saddle but leaving the tool still just touching the wheel. Now, lock the saddle and run the tool off by means of the tool post slide. This will give you the taper.

(5) Put a center drill in tailstock chuck, follow with 19/64 drill and reamer 5/16" which will give axle bore.

(6) Check over all dimensions, then remove from chuck.

(7) Grip wheel by tread, that is, flange outward, and face off to proper thickness both flange and hub.

(8) Turn edge of flange to correct diameter and round the corners with a few strokes of a fine file.

The same procedure may be adopted for the engine and tender truck wheels up to operation (6) then mount on a mandrel, turn flange, round the corners, face off back, and finish at front contour. Polish the rim with dry emery or aloxite cloth held on a flat stick against the rim while running at top speed in lathe. Before taking out coat the face of rim with clear lacquer by holding a brush well charged against the rim while the lathe is running on slow speed. About three revolutions will be all that is needed. This will preserve the polish.

Drivers—If the chuck is large enough the driving wheels can be machined in the same way as the trailers, if not, then bolt to the face plate, with two bolts

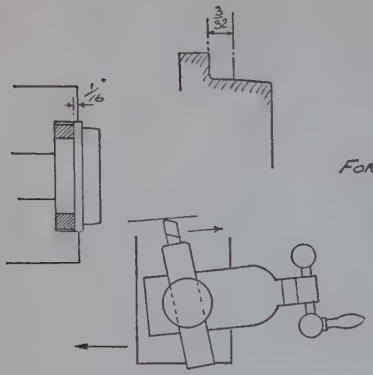


Fig 36

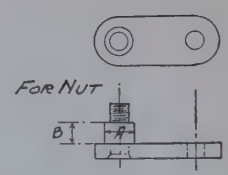


Fig 37

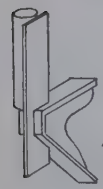


Fig 38

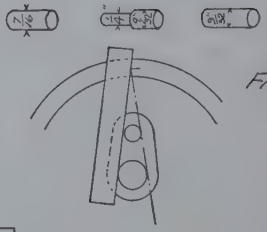


Fig 39

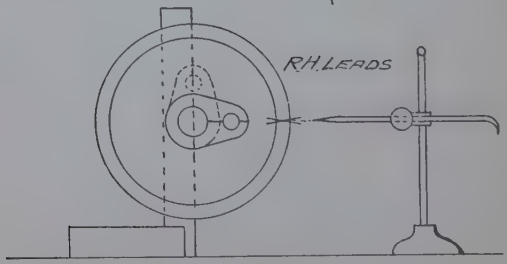


Fig 40

passed through between the spokes. Do not screw up too hard or there is a liability of bursting the spokes. Get the casting running as true as possible, adjust bolts as required and then follow out operations (1) to (6) with the proper dimensions, of course. Reverse the wheel, and face off back. Treat all six wheels the same, then mount on mandrel run between centers turn and round off flange and polish rim.

Now, we will need a jig made like Fig. 37. The plug portion A should be made a close fit to the wheel bore. If the latter is reamed with standard reamer, the plug of jig may be made half a thousandth less, in our case this will be .437. The length B should be about 1/32" less than the depth of wheel hub. The hole had better be made 5/32".

Slip the jig into the wheel from the front side, adjust central between the two short spokes, tighten up the nut, place the wheel on two pieces of parallel packing high enough to clear nut and run a 5/32" straight fluted drill through. The straight fluted drill will produce a cleaner hole than the regular twist drill in soft cast iron.

The crank pin holes can now be opened out to ¼" for the front and back and 9/32" for the main by means of a pin drill or counterbone made like that used for axle boxes.

Axles—Cut the lengths required about 1/16" longer than finished over all dimensions. Now hold in chuck and face off one end smoothly at the same time center drill from tailstock. Do this to all the axles, then set the universal square to proper overall dimension, lay the pieces against the blade with the finished end resting on stock of square and scribe against end of blade. Just a short mark will do. No need to go all round. Put the axles back in chuck and face off to this mark, and center drill at same time.

Check over the length. The axles may now be turned between centers in the regular way taking care to get the "fit" correct. A micrometer is very useful; in fact, the amateur should acquire one of one-inch capacity as early as he can. It will help considerably in knowing exactly what size a piece is rather than having to depend on "feel" of calipers, etc. If you have no micrometer turn a piece of steel so that it is a snug fit in wheel bore, same kind of fit as a piston. Then lay a piece of thin tissue paper on and set the outside calipers over the paper and pin. This will set the calipers to about one thousandth more than pin diameter, and should give a proper driving fit to axle in wheel bore. Before mounting the wheels, check over the axles for "between hub" dimension. This should be 2-1/32" for Engine and Tender truck axles, 2-7/32" for trailer truck axle and 2¼" for driver axle, assuming no error has been made in wheel hubs. If there is any wheel hub that is too low, the trouble can be rectified by increasing length of axle over shoulders to suit.

Trailer Truck wheels can be pressed on, observing the same procedure as adopted with valve bushes. Do not forget to dope the axle with a paint of lubricating oil and white lead. Before pressing in and see that edges are smooth and without burrs either in wheel or axle. Press on one engine Truck Wheel only for the two axles.

The driver wheels will have to be put on at right angles to each other so proceed as follows:

Make three nicely fitting plugs Fig. 39, to fit in wheel bores so that they stand up about ¼". Now lay a straight edge against the plugs and mark the rim of wheel. Do this on each side of plugs and the intersection will be exactly in line with axle center. This should be carried out on all drivers. Now press on one wheel and lay it in a V block, on surface plate. Set the surface gauge needle to the axle center and turn the axle around so that the line on rim registers with needle. Scribe a line across the crank pin boss and wheel hub. Now, take the square and turn the wheel and axle round so that the line just scribed is exactly along edge of square. Hold the axle in this position. Take the other wheel and push on by hand. It should go on about 1/16" without force. Bring the surface gauge around and turn wheel on axle till the point on rim registers with the needle. The crank pin holes should now be at right angles to each other. Press the wheel right on.

Next month we will take spring and brake rigging.

NEW YORK SOCIETY OF MODEL ENGINEERS

The Annual election of officers was held on April 23rd, with the following results: Chairman, Mr. Walter Elliott; Treas. and Rec. Sec'y, Mr. F. D. Grimke; Gen. Sec'y, Mr. T. E. R. Singer; Marine Sec'y, Mr. H. M. Oliver.

The Executive Board remains the same with the exception that Mr. T. Tenniswood replaces Mr. E. P. Alexander.

During the past year the Society has nearly doubled its Membership, and has considerably increased its bank balance.

The Annual Spring Race for Model Power Boats will take place on June 16, and the Fall Model Power Boat Race, September 22, to be run on Conservatory Lake, Central Park, 72nd Street and Fifth Avenue, New York. This year at least twelve entries are expected which will include boats powered with gasoline, flash steam, and pot boiler installations.

The Model Exhibition held last January was such a Success that the Committee is now working upon the arrangements for a much larger Exhibition to be held next Winter.

Mr. John Dombrowski, 838 Bremen Street, Milwaukee, Wisconsin, writes us that he likes The Modelmaker very much, and renews his Subscription. He is particularly interested in Model Stationary Engines and Boilers, a number of which he has already built. He would like to construct a Model Corliss Engine, provided he could get drawings and castings. He asks us to put him in touch, with any of our readers residing in his locality, with the object of getting acquainted with other Modelmakers, and if there are a sufficient number, the formation of a Model Engineers Club, for mutual benefit.

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TO O-GAUGE MODEL RAILWAYISTS

By MR. F. M. DE RIPPERA.

(Continued from page 92)

If you need a change, leave the wild mountains and return to Newcastle where you will find all the work you can get thru for at least three months of your spare time. The wall portions A and B should be painted to represent the usual surroundings of the station in a small city. If not sufficiently keen on drawing and painting, have it made by an artist. It will prove to be worth the money. Do not forget that the station at Newcastle is not something in the style of the New York Central's Terminal in New York, but a modest little house. X will have the usual appearance of a coal mine.

As soon as this little portion of the United States is ready "from Nature's hand," go ahead with the track-laying. No tinplate rails but American section steel or aluminium rails on wood ties. Presuming that the locomotives are to be electrically driven, the question of conductor rail must be settled. The outside third rail does not mean that no steam locomotives are running on that line, but it tells you that electric engines do. In the present case an electrification will be much too expensive, wherefore the conductor rail must be hidden as much as possible, in order not to spoil the realism of the line. The track may also be laid according to the Insulated Rail and Wheel System fully described in the January 1927 issue of "The Model Railway News" by Mr. A. S. Coolidge, Pittsfield, Mass., and in Mr. Henry Greenly's "Model Electric Locomotives and Railways" page 64. I should however prefer the method shown on fig. 2 which will be suitable for the Automatic Stopping device which I shall describe later with the Editor's permission.

The first locomotive you will need is a contractor's engine.

Do not choose the usual saddle tank locomotive which will be of no real use later, but build it to the outlines of a small 0-6-0 Switcher with tender with Sloping Back Tank. Do not forget that the greatest charm of the motive power of a miniature railroad is variety. Your heavy freight locomotives will look much more imposing when standing beside a small switching engine like the Pennsylvania Class B-6sb than if compared with the same Company's Class C-I. As to the rolling stock, a few flat cars and low-side Gondola cars will do for the present.

As soon as the line is ready, you will need at least two Heavy Freight Locomotives (tractive power of prototype, about 71.-500 lbs) and an Oil Electric Car for the passenger service, a dozen of Hopper Cars. If your stock of patience is not sufficient to build them yourself, get them from one of our advertisers.

When designing your freight locomotives do not inspire yourself too much from long locomotives. An O-Gauge Chicago, Burlington & Quincy 2-10-4 freight engine Class M-4 will look per-

fectly ridiculous when negotiating the more or less out-of-scale sharp curves which are almost unavoidable on indoor systems. Further, a long rigid wheelbase will require that all drivers, with the exception of the front and hind drivers, are flangeless and with very wide tyres, in other words the horrible kind of wheels which according to the striking expression of a British model-railwayist, makes the locomotive look like a girl with Russian boots.

A Consolidation (2-8-0) will do fine work on your system. For those who have the impression that this type of locomotive is not suitable for heavy work, I shall mention that the bulk of the traffic on the Western Maryland is moved with Consolidations Class H-9 which have replaced Mallet locomotives. One of these Consolidations hauled 100 loads of coal weighing 7842 tons.

Another Consolidation which will be easy to model on account of its straight top boiler is the Lehigh & Hudson River Railroad Class 90.

Build both freight locomotives at the same time. An easy way of making dummy rivets in the smokebox will be to force a correctly turned wood-block into the brass tube from which the smokebox is made. Drill all holes for rivets through the tube only and drive small nails into the wood-block. The result is very realistic. Further, this arrangement makes it much more easy to fasten the various external fittings of the smokebox and the smoke-box door. Do not be afraid of using wood. When well painted, it will look exactly like metal. Wooden cylinders with brass or steel cylinder and steam-chest heads will give very fine results.

Equip all your locomotives with Markle crossheads which are the easiest to make as they require no machining. None of the external fittings which give American locomotives their distinctive appearance must be omitted. Boiler tube pilots which are difficult to build in such a small scale, may be replaced by steel plate pilots as used on the Lehigh & New England Decapod type locomotives No, 401 and 402. As regards the castings for the tender and car bogies, see advertisements in "The Modelmaker."

Well, X is growing from year to year and has now reached the size that gives it the right to the designation "City." The old style loco-shed has been replaced by an up-to-date roundhouse with a 100 foot turntable. The passenger service has grown at such an extent that steam operated trains are required instead of the oil electric car which has been retired from service and promoted to inspection car.

At the beginning you will only need smaller locomotives such as the New York Central Mikado (2-8-2) Class H-10-A and H-10-B, equipped with booster. The increasing number of passengers to be carried will soon necessitate heavier passenger trains. Some huge three-cylinder Mountain type locomotives with booster (dummy) somewhat like the Denver & Rio Grande Western Class M-75, will be broken in.

Wishing to keep your line up to date, old locomotives are replaced in the course of years by modern engines. Whether you build the new locomotives from the old engines or not, keep one of each class. When

celebrating the Railroad's 25th Anniversary, old veterans are absolutely necessary in the Pageant which must naturally be held.

Mr. G. P. Keen, President of the Model Railway Club, London, says: "I think a model railway should always be complete but never finished. It should always be complete enough to run its contemplated service, but it can never be finished, because there will always be alterations, additions and renovations to be carried out." There will nevertheless come a day when rest is required at the cost of the hobby. You may then consider your work as finished and the railroad as complete. Then sit down, holding your white-haired (or bald) head on a level with the track, and enjoy the sight of the life outside the new large Terminal at Newcastle, the busy switching engines, the powerful freight locomotives en route for X City, and finally, as a culmination of realism, the arrival of the daily express, the Black Diamond Limited with its Pullman equipment.

A system built up that way is not a child's toy, but a small scale portion of the big world in a nut-shell which entitles its creator to a full-size feeling of pride.

Mr. H. W. Pontin has very kindly sent us a few more of his new post card photos of famous American Locomotives, and trains under full steam. They are certainly most realistic and are worthy to go into any Model Fan's Album. He reports a great many orders for these cards from all parts of the States.

Mr. Frank Birch has sent us a piece of his new steel rail suitable for ¾" or 1" scale passenger carrying railroad, the shape and material are excellent. He has also sent us a rough casting of his cylinder for ½" Pacific. This is a very good clean casting. His ¾" scale Pacific which he recently finished for a customer has been under trial on his test railroad, and has made some very successful trial trips. The Customer is so well pleased with this Locomotive, that he is considering having another engine of the same scale, but different type constructed. We have seen some of Mr. Birch's finished work, so we feel sure his ¾" Pacific must be excellent.

BOOK REVIEWS

A Pocket Book for Chemists, by Thomas Bayley, Edited by Robert Ensoll, 9th edition, 460 pages, 4¼x6½", $2.50.

After many years of valuable service this well known work has reached its ninth edition. The original author who was a public analyst and manufacturing chemist, endeavored through his long and useful career to make this handbook the very best of its kind in the English language. Since his death the new editor is endeavoring to carry out Mr. Bayley's high ideals, and we believe the ninth edition will be well patronized by the chemical industry at large. It is specially intended for Chemical Manufacturers, Metallurgists, Dyers, Distillers, Brewers, Sugar Refiners, Photographers, Students, Etc.

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THE CONSTRUCTION OF A "WALL" GASOLINE ENGINE

By Mr. E. K. LOCKWOOD

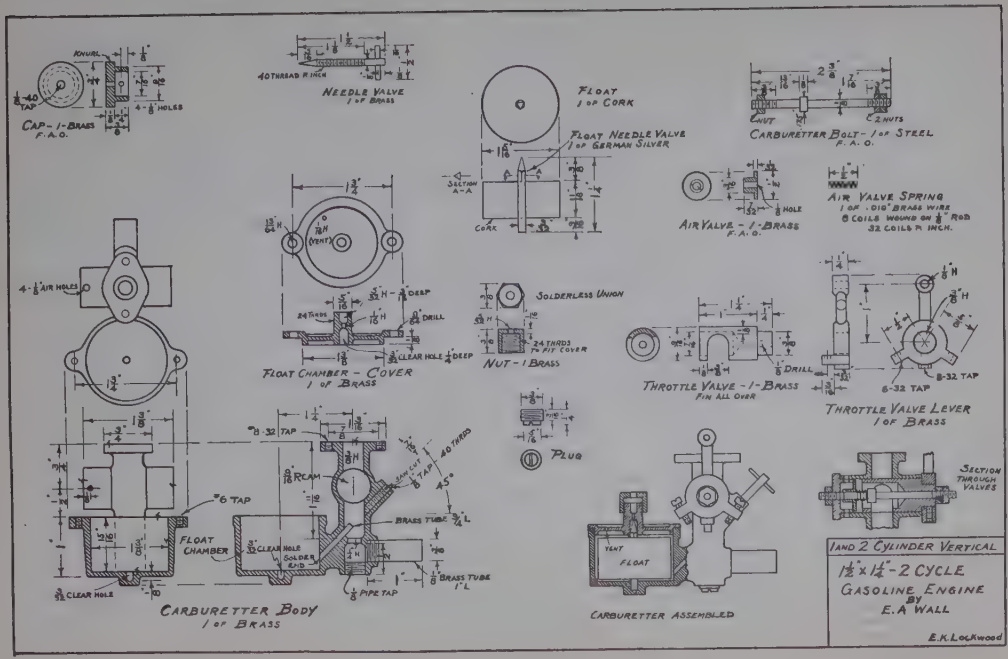
(Continued from page 46)

The Carburetter

The first piece to be finished is the carburetter body which is not a difficult job to perform. The hardest part of it is drilling the hole for the jet tube and needle valve which should be done first. It will be noticed that there is a chucking piece cast integral with the body where the plug is shown on the assembly drawing. The operation was performed as follows: The casting was chucked by this chucking piece and the chuck clamped to the table of a drill press which had been previously set at a 45° angle by means of a protractor. After making sure of the alignment, the hole was drilled through into the float chamber.

Now screw the chuck on the lathe spindle and face off the flange. By means of a center drill in a drill chuck placed in the tail stock spot the center of the face just finished and then drill out to a depth of 1-11/16" using a 3/8" drill and follow this with a 1/4" drill thus forming the choke tube. The casting should now be removed and chucked by the valve chamber. Bore out the valve chamber to a scant 9/16" and face off the outer edge. Reverse the casting and finish off the opposite face making the width of the chamber exactly 1 3/8". Now remove the casting and finish the bore with a 9/16" reamer and saw off the chucking piece. The casting should now be chucked by the bowl and by using a boring tool the inside of the float chamber may be easily finished and the top edge faced off. Spot a center hole in the bottom of the bowl and drill a 3/32" clear hole to a depth of 1/8" after which the piece may be removed from the chuck. Next mark out the air holes shown and the holes in the flange, drill out their respective sizes, and then tap the flange holes and also the hole for the needle valve. The holes for the large brass tube and the plug should now be located, drilled out, and properly tapped. Now finish off the jet tube and insert in place and solder same in place. This piece may now be laid aside.

Now take the float chamber cover casting and chuck in the lathe by the top and finish it off as required being sure to make it fit quite snuggly into the carburetter bowl. Spot the center and drill a 3/32" hole to a depth of 1/4" and then follow with a 1/16" drill running this right thru. Next reverse the piece in the chuck and turn the projecting part to 5/16" diameter and then thread it with a 5/16"-24 thread die. Using a 5/32" drill the hole in the top may now be opened out as shown for a depth of 3/16". After the vent hole and the screw holes have been drilled out, the cover may be placed in the bowl and used for a template in locating the screw holes in the carburetter body.


KNURL
CAP - 1 - BRASS F.A.O.
4 - 40 TAP
4 - 1/8 HOLES
40 THREAD P. INCH
NEEDLE VALVE 1 OF BRASS
FLOAT 1 OF CORK
FLOAT NEEDLE VALVE 1 OF GERMAN SILVER
SECTION A-A
CORK
CARBURETTER BOLT - 1 OF STEEL F.A.O.
2 NUTS
AIR VALVE - 1 - BRASS F.A.O.
1/8 HOLE
AIR VALVE SPRING 1 OF .010" BRASS WIRE 8 COILS WOUND ON 1/4" ROD 32 COILS PER INCH.
4 - 1/8" AIR HOLES
FLOAT CHAMBER - COVER 1 OF BRASS
24 THDS
DRILL
CLEAR HOLE 1/4 DEEP
SOLDERLESS UNION
NUT - 1 BRASS
24 THDS 7/8 PIT COVER
THROTTLE VALVE - 1 - BRASS FIN ALL OVER
1/8 DRILL
8-32 TAP
THROTTLE VALVE LEVER 1 OF BRASS
PLUG
8-32 TAP
REAM
40 THDS
45°
6 TAP
BRASS TUBE
FLOAT CHAMBER
CLEAR HOLE SOLDER END
1/8 PIPE TAP
BRASS TUBE
CLEAR HOLE
CARBURETTER BODY 1 OF BRASS
VENT
FLOAT
CARBURETTER ASSEMBLED
SECTION THROUGH VALVES
1 AND 2 CYLINDER VERTICAL
1 1/2" x 1 1/2" - 2 CYCLE GASOLINE ENGINE
BY
E. A. WALL
E.K. LOCKWOOD

The machining of the rest of the parts is very simple and need no further explanation. However, before the carburetter is finally assembled, the cork float should be heavily doped with celluoid varnish otherwise the float will become gas logged and consequently the carburetter would not function properly.

After the model has been completely assembled and provided with a fuel tank, the model may be tested. The engine being of the two cycle type does not require any oil in the crankcase. A mixture of oil and gasoline in the ratio 1 to 18 should be put into the fuel tank and after the ignition apparatus is properly connected up, open the throttle valve about half way and open the needle valve about one turn and try starting. No exact setting of the carburetter may be prescribed for this varies with different engines and therefore must be found by experiment.

Priming the engine will make its starting easier and this may easily be accomplished by putting a little gasoline in the exhaust manifold and when the engine is turned over slowly, the gas will enter the cylinder when the piston reaches its lower dead center. However, care should be taken in doing this not to flood the engine for if it is flooded, it will not start.

It might be well to add in closing that with engines of this type it is absolutely necessary to have all joints perfectly tight, for if there are any air leaks, the mixture will be upset and consequently the engine will not run properly or if the leaks are bad, it will not run at all. A good plan is to put some oil around all the joints and turn the engine over and observe if any bubbling occurs at any joint. If so, this should be provided with a good gasket. It is well to use gaskets throughout and may save you some trouble later.

The writer does not advise anyone to deviate from the plans when building one of these engines. It must be born in mind that these models were scientifically designed by a man of great experience and these models operate perfectly when constructed according to his plans.

Mr. P. L. Smith, Chief Engineer, S.S. Orient of the Quaker Line dropped in to see us. He had just come from the Gerold Company from whom he had purchased a Wade No. 2 Lathe with full equipment. He has a good machine shop on the ship, but he wanted a small Lathe to make small parts. He has built a number of Models and was considering something new after purchasing a complete set of The Modelmaker and the current Subscription he devoted some time looking over a set of Coventry's B. & O. Locomotive drawings. He has since bought a complete set of castings, parts and drawings for this locomotive to take to sea with him as he told us he had plenty of time at sea to devote to such a fine piece of work.

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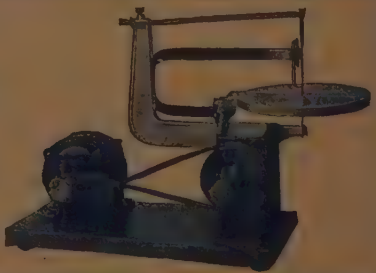

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OUR FOREWORD

The second postponement of the New York Society of Model Engineers Spring Model Power Boat Race owing to some of the boats not being ready, gives another man an opportunity to try out the latest type of Wall Marine type water-cooled gasoline engine in a new hull that has just been finished.

While the time for installation and tryout is very short it is nevertheless hoped he will be ready for the race which is scheduled to take place on the Boat Lake, Central Park, New York City on July the 21st at 9 A. M. In the event of bad weather the race will be run off on the following Sunday morning.

There are already three gasoline engine powered boats entered for this face, and if the latest contestant is ready it will mean four entries as well as several boats with steam power installation.

This will be the first time that Mr. Bosshardt has had any other boats similarly powered as his own to contend with and it is hoped that each of the four boats will make a good showing.

Great interest is being taken in this event owing to the fact that the two types of power plants, steam and gas, will be tried out on equal terms, viz. on the end of a fifty foot cord secured to a pole, placed in the water. In this arrangement each boat has a clear course, and equal opportunity to show its speed.

There will be a certain number of laps, each lap being timed in the usual way.

The boat making the requisite number of laps, on a taut cord, in the shortest time, will be declared the winner.

Mr. H. J. Coventry informs us that he has made arrangements with Mr. Kennion, 744 Old Ford Road, Bow, E, London, to act as his English representative for the drawings, supplies, castings, and other materials for his Model B. & O. President Washington. For the convenience of any Modelmakers in England or Europe. The 15 articles Mr. Coventry is contributing to The Modelmaker giving detailed directions for the building of one of these Models commenced in the October 1928 issue. All these back numbers can be supplied.

THE KITCHEN FOUNDRY

By MR. FORRESTER S. WYMAN

No doubt readers of the "Modelmaker", have many times wished to use small castings in connection with their work, and have been unable to produce these, themselves or purchase them and have had to substitute some other means to secure the desired results.

In this article the writer will endeavor to outline a procedure whereby any modelmaker can produce all the small castings he may wish from white metal and the expense will be very small. Not only that but the castings will be durable and of efficient strength to meet most all the needs of model making.

This white metal is produced by the National Lead Co. of New York and is intended for use in die-casting where compressed air is used to force the metal into the dies. This metal cannot be cut with a knife and should not be confused with the so-called type metal. If properly used it will flow well and produce good castings which can be drilled, turned and finished as one desires.

For a start, we must have some knowledge of making the patterns and while at first it may seem to be a difficult proposition, it really is rather simple.

For tools and supplies in this part of the procedure, one needs a thin bladed sharp knife, a shoe makers knife with a pointed end is best, some fine clear grained white pine wood, thoroughly dry. Some times a packing box of this wood, can be found and one of these will make a good many small patterns. A can of good glue, some orange or white shellac in liquid form, some sort of wax, such as bees wax, sealing wax, or even flake shellac. This wax is to be used for patching any breaks in pattern in the making, and it is also useful in filling in along sharp corners which are liable to pull the sand when pulling the patterns out of the molds. Small files, are useful, flat knife edge, rat-tail, also fine sand paper and a small scroll saw. The usual wood working tools also are required to get cut the stock to dimensions.

Of course, for round patterns such as wheels, disks, etc., a lathe to turn them in is an asset, but if one is not at hand such work can be purchased in wood turning shops or in some cases fashioned by hand.

A pattern is simply a wooden model of the part which is to be produced as a casting, and so the first step to produce the casting is to make such a replica in wood.

In producing the replica, there is one very important point to be observed and that is what a pattern maker calls "draw". To illustrate let us take a truncated pyramid. Fig I. Suppose this pyramid resting on a base "X Y", the "draw" in this pyramid is represented by the sides A and B and equally of course by the opposite sides. Thus you see the "draw" represents the slope of the sides of the pyramid from the top to the bottom.

Now imagine this pyramid tightly packed in sand up to its

top, next insert a sharp awl in place of the arrow and pull upward in the direction the arrow points. Pull slowly and do not wiggle the awl and you will find the pyramid lifts out rather easily and leaves a clear impression in the sand, and thus you have an illustration of the use of "draw" in a real pattern.

In making patterns of any kind this principle must be observed and it is very important to have these "draw edges" very smooth and patterns so made will draw out of the sand which is used for making the mold and leave a clear impression which is exactly like the pattern which was removed. Remember, too, that the "draw" is much exaggerated in the sketch and in real patterns the draw will be much less—about 1/16" to each inch of height should be sufficient.

Let us now proceed to make a pattern and for a sample pattern we will take a locomotive driving wheel, for most every one is familiar with one of these and can see one easily for observation if necessary. First it is best to make a drawing, for size, design, laying out of spokes, etc. The first step in the actual pattern will be the wooden disk made according to the drawing. This disk will be thickest at the hub and thinnest where the spokes enter the rim. The back may be made perfectly flat or it can be tapered from the hub to the inside edge of the rim to provide for clearance when running, but it is best to provide this clearance in some other way for this method makes casting more difficult.

Next layout the spokes according to drawing and draw lines with a soft pencil from hub center to rim, the line to represent center line of each spoke, for that will be about all that will be left of the face of the disk when the spoke is finished. Be sure to mark out the counterweight space and provide also for your crank pin, for you will not cut this part out. Remember that the "draw" in this pattern will be from the back to the face of the wheel. The spokes will be widest on the back, the rim widest at the back and the same is true of the hub.

Now take your knife and proceed to cut out between the spokes watching the grain of the wood sharply. Make the first cuts half way between each spoke and work gradually toward the line as you proceed in depth. Be careful when you cut through to the back not to chip the spokes. Work each spoke with the knife until near the finished dimension when files and fine sand paper can be used to finish the job.

Where the spokes enter the hub, be very careful to have the hub smooth and the angle between spokes not too sharp, also where spokes enter rim, the corner should be rounded just a bit, rather than a sharp corner.

Where your counterweight and crank pin are to come, the "islands" you left in cutting will be on a slant. Cut and shape a piece of wood to glue on to these spaces to build them up to the desired height. Be sure to remove all surplus glue very carefully, if you don't moisture will get into it and cause the sand to stick later and cause trouble.

The pattern finished the next step is a coat of shellac. The ordinary store shellac should be diluted about ½ with alcohol and 2 or 3 very light coats applied

Fig 1

Fig 2

Fig 4.

Fig 5.

CORE BOX. Fig 3

until the pattern has a glass finish.

All patterns with one side flat or with very flat projections on the backside may be made in this way.

For cylindrical or patterns having rather high projections on both sides, another method must be used, so I will outline one which will cover this phase of the subject and also the use of cores.

To make a smoke stack pattern, Fig. 2, first take two pieces of wood longer than is needed for the pattern. Plane two sides perfectly flat and nail together with a small brad on each end. The extra stock on each end is used, to hold the pattern stock in the lathe, or if no lathe is used, It is useful for a handle. The top end of the stack may be turned to dimensions, but the bottom end at "X", will have to be hand cut to fit the boiler curve, or may be turned as is the top and the casting filed later to make a fit. The two ends "A" and "B" are turned round and to the size of the bore of the stack and when pattern is molded, will form a cavity in the sand for the ends of the core to rest.

Before cutting off pattern to length drill a small hole the size of a common pin at P and P(1), but do not go all the way through on one half of the pattern. A common pin can then be pushed into the hole and cut off flush at P and P(1). These two pins will hold the two halves of the pattern together when molding and keep them in line.

This pattern requires a core to make the casting hollow when finished. A core is made of sand about as coarse as granulated sugar. A very small quantity of molasses is mixed with the sand to make it stick together and is then shaped to fit the desired cavity. After shaping, bake it in the oven till hard then it is ready to use in the mold.

The correct way to form a core is to use a core box Fig 3, which in this case would be made by using two pieces of wood similar to those used in making the stack pattern and in each half cut a depression the shape of ½ the core. The two cavities would then be filled with the sticky sand and after leveling off, pressed together, then one side is removed allowing the finished core to rest in one side of the core box. Place in oven and bake until stone hard.

To facilitate removal of the core from box, line it with melted parafine, oil, or black lead, this prevents sticking.

In the stack pattern, on each end, I made provision for the core extending well beyond the end of the pattern. In some cases where cores would be used, this practice could not be followed for lack of room. In such cases the core would be made just the exact shape of the desired cavity and its suspension in molding would be accomplished by means of a small wire running through the center of the core. The wire would rest in the sand and support the core and should be large enough to hold the core clear and allow the metal to flow and fill the mold.

(To be continued.)

When writing to advertisers, please mention "The Modelmaker."

ONE MAN'S WORK

By Mr. W. Pierce

In answer to your letter of May 22 requesting a description of my Models, I will describe same to the best of my ability.

First the locomotive is a ½" scale, 2½" gauge Pacific Type. Drive wheels 3¼", Pilot wheels 1 7/16", trailer wheels 1 3/16", water tube boiler is solid drawn brass tube fitted with three ¼" copper tubes, silver soldered; boiler ends are soft soldered with ¼" drill rod as stay bolt. Has steam gauge, water glass, blow off valve, check valve, safety valve. Fired with alcohol burner, fuel is taken from the tender, which is divided into two parts, one for fuel, the other for water.

Domes, air pump and air tanks are dummies.

Cylinders are 11/16" bore, 1⅛" stroke, piston valve.

This is my first attempt at locomotive building.

The second model from the left in the illustration is a twin cylinder marine type slide valve steam engine, cylinders 1" bore, ⅞" stroke, fitted with four drain cocks and displacement lubricator. Height 5½"; crank shaft turned from solid steel 5/16" dia., 6" long, flywheel 1¾" x ¾".

The third from left, is a vertical type slide valve Steam Engine, 1" bore, 1" stroke, height, 7½", flywheel 3⅝" dia., by 11/16" width.

The fourth from left upper, is a twin cylinder slide valve single acting steam engine, direct connected to a centrifugal pump. Cylinders ¾" bore, ¾" stroke. 8" long, 4½" high.

The fifth from left is a horizontal slide valve steam engine 1" bore, 1" stroke, 8" long, flywheel 3½" dia., 11/16" width.

The sixth from left is a uniflow type poppet valve steam engine, 1" bore, 1" stroke, 5" high, 4" long, flywheel 3¾" dia., 4/32" width. It is fitted with release valve and displacement lubricator.

The one on the right of photo is a vertical slide valve steam Engine, 1½" bore, 1¼" stroke, 9½" high, 6" wide at base. Crank shaft 7/16" x 6". It has two drain cocks.

All castings for the seven models described were furnished by Mr Frank Birch.

The Model on lower left corner of photo is a single cylinder gasoline engine, Four cycle type, float feed carburetter, with needle valve adjustment. 1½" bore, 1½" stroke, piston fitted with two rings. Ignition is a Ford coil and wipe make and break contact in conjunction with 4 dry cells. Height 7½", bearings Phosphor bronze, crank shaft turned from a solid piece of tool steel. I will never try to turn another crank shaft from tool steel. The castings for this Model were furnished by Mr. Elmer Wall.

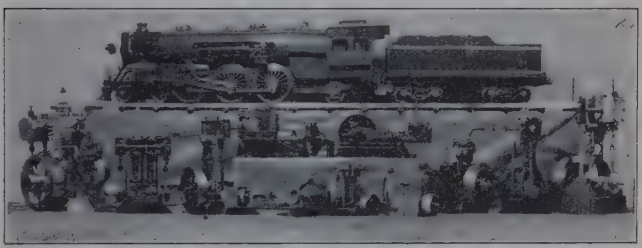
The second model from right of photo is a vertical type slide valve steam engine 1" bore, 1" stroke, all bronze castings 7½" high. The castings for this model were furnished by the Model Machine Shop.

The three models in lower center of photo were made without castings. The one on the left is a slide valve horizontal steam

engine, 1¾" bore, 1" stroke, 6" long, 4" wide. Outside of the valve action it resembles a Corliss type engine.

The one in center of group is a vertical marine type slide valve steam engine, ⅝" bore and ⅝" stroke, 4" high.

The one on right is a twin cylinder single acting type steam engine, ¾" bore and ¾" stroke. The cylinder block is made of 2" square brass. The crank case is made of a solid piece of cast iron sawed in half and hollowed out with a drill and cold chisel. This was one of my



first Models, and I did not know whether it would run. I made a boiler from a piece of 3" brass tube and a pump to fill it. Under steam this engine ran fine, and I have since run it so many times, that it is now nearly worn out.

Will give a short description of my Workshop. It is located in the basement, which is warm in the winter and has a fan to keep it cool in the summer.

The following is a list of my tools and equipment:

South Bend Lathe, 9" swing, 4' bed.

Sensitive Drill press 0—⅜".

Black & Decker high speed grinder with drill grinding attachment.

Van Dorn high speed grinder 6".

Polishing Motor.

Direct connected blower and gas torch.

Air compressor for testing models.

Wade bench lathe.

7" circular saw.

Jig saw.

Bench shear.

Small motor with a variety of grinding wheels.

Tool chest full of machinist tools.

Gas furnace.

Tool cabinet 6' x 3' full of wood working and machine tools.

Numerous vices, taps, dies, drawing instruments.

Electric hand drill, flexible shaft motor and chuck.

Blow torch, electric soldering irons, case full of books on mechanical subjects, laboratory Microscope, and the usual amount of rods, bars, sheets in brass and steel, and also quite a lot of junk.

I sure get a great deal of pleasure out of my Workshop. Every machine has a separate motor.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 112)

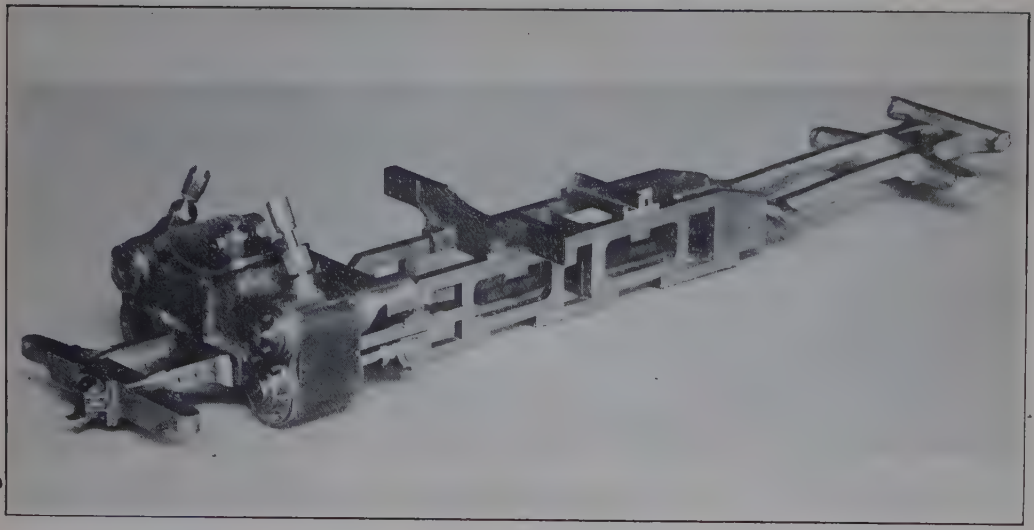
Spring Rigging and Brake Rigging—The spring rigging should present little if any difficulty, as only simple turning is involved and the rest is a straight forward, bench and hand tool job. It will be better to make the Frame Fillers Part No. 468 first as they can then be placed in their proper place on frames between the drivers. File up to dimensions, mark out for holes, drill the bosses No. 2/56 tapping size No. 49, then cut out the 1/16" slots with hack saw and warding file. Next open out the hole No. 44 in front and tap back No. 2/56. Fit the brackets exactly midway between the driver axle centers.

Now, make up the spring rigging details comprised by drawing 64 for drivers, and drawing 62 for trailer truck. The spring hangers part number 264, are made of 3/16"—20G strip brass and as there are quite a number, it is a good plan to make a simple jig for the drilling. The sketch Fig. 42 shows such a jig for jobs of this kind. The strips are cut off a little longer than 1-1/16" and placed in the jig flush with one end and locked with a small pinch screw.

The spring hanger part No. 164 is drilled one end for a 2-56 bolt and other end drilled No. 53, for a press fit No. 52 drill rod pin ¼" long.

Spring saddles are made of 1/16" annealed brass bent over a small profile jig. To make the jig, take a piece of steel ½" x ¼" x 9/16" long. File up to 7/16" wide one end, ¼" at other and case harden. This makes a bending jig, also a filing gauge. Anneal the brass before bending by making red hot and quenching in water.

The method of carrying the spring equalization through to the trailer truck needs a little explanation. Over the rear end of rear driver spring is placed a special eye clip No. 664. It will be seen that this has a rectangular opening to receive the spring end and also a forked end ¼" wide. This latter end slips over the main frame thus retaining the spring in proper position. Connecting the two spring clips (one each side) is a double forked link or yoke No. 764 sometimes called the transverse equalizer. This in turn is connected to two hangers No. 1064 the lower ends of which hook over the ends of trailer truck equalizer beam. It will be noted that the hangers 1064 are both well inside the main frames, and the trailer truck equalizer beam slopes outwards to connect them to the trailer truck spring hangers and spring. The spring clip No. 664 and yoke No. 764 are made from solid brass 3/16" thick while the two hangers No. 1064 are turned from 3/16" square cold rolled steel. The slot in end is easily formed by drilling three No. 44 holes and removing the pieces between holes with a jewellers saw. The ends will



FIRST SIX SECTIONS OF THE B. & O. "PRESIDENT WASHINGTON" MODEL LOCOMOTIVE.

later be twisted relative to each other by making red hot and turning in pliers, but this little operation can well be left till the rigging is assembled.

The trailer truck equalizer beam No. 282 needs no comment except a warning not to drill the fulcrum pin hole. This should be done on assembly by marking off from trailer truck frame.

Brake Rigging. — This is drilled in web of guide yoke, and a spring is provided between the piston and guide yoke to pull the brakes off. The forked ends of push rods No. 1367 are connected to the brake Levers No. 167 which are pivoted on a Fulcrum shaft carried in brackets bolted inside frames. The lower ends of brake levers are connected through equalizing levers to the brake beams, 1067-

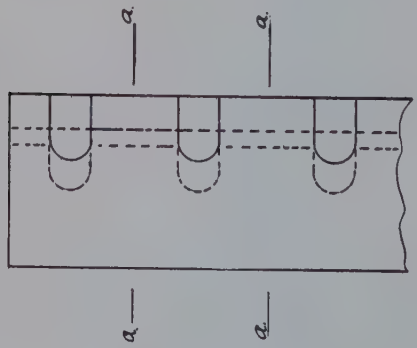


Fig 41

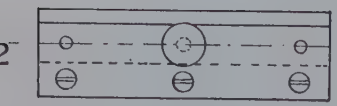


Fig 42

shown in assembly on drawing No. 66 and details on 67 and 68. It will be seen that just behind Cylinders is a duplex brake cylinder bolted between frames. The pistons are plain and made a good fit and drilled to receive the Push Rods. Note that the push rods are not connected in any way to the pistons. They merely bear in the bottom of the hole in piston. The push rods pass through the two holes 1267, the ends of which swing in brake shoe hangers No. 568. These latter in turn are carried in the Frame fillers that have already been described for spring rigging.

Brake Cylinder—This casting should be faced up one side and frame fit filed or milled square to it. Then mark out centers, clip to face plate drill, bore and ream ½". Drill steam passages and tap out 7/32"-40 for auto-

matic valve. Turn up the covers which are screwed to end nearest the valve, and steam passages. The pistons are to be made a close sliding fit in cylinder, a few small V grooves turned in acting as seals. The The 1/16" boss on rear face of piston is to provide clearance for steam passage. Part No. 568 is to be filed up and made an easy fit in Frame filler No. 468. Part No. 668 is fitted to lugs on rear frame cradle while part No. 768 is to be screwed to frames on inside at location indicated on frame detail drawing.

The brake shoes are made by turning a ring of cast iron and cutting it up into pieces filed to proper profile.

The best way to turn the ring is to grip in chuck by outside jaws, bore inside and face one side. Change jaws to inside, place the ring in jaws with machined face inside, turn outside, also groove and face off outside.

Brake levers No. 167 may be held in chuck, faced and bored then mounted on a ¼" mandrel and the other end faced off. Note that one is fitted with a set screw to secure it to the shaft while other is free to turn. The long end is coupled up to the push rod 1367 and lower short end is connected to the screwed fork, 267. The hexagon nut 367 connects the two portions of the screwed fork thus providing adjustment of brake beams.

The brake beams are built up of 3/8" x 1/16" flat brass with forked trunnions pinned and silver soldered on.

Next month side rods and motion work will be taken.

When writing to advertisers please mention The Modelmaker.

A CORRECTION

Mr. H. W. Pontin, has requested us to make the following correction. In the June issue we inserted a short account of The Boston Model Club, in which we stated that the Membership would close with the next meeting. It should have read the "Charter Membership" will close with that meeting. The Secretary would be very pleased to give full particulars about their Club to any of our readers who would like to join.

Mr. Chas. A. Cole, Western Agent, for the Wall Gas Engines has sent us a new illustrated folder describing the two latest types, of these engines. He will be glad to mail a copy to any of our readers, upon receipt of a stamped and addressed envelope.

Mr. H. M. Oliver, Marine Secretary of The New York Society of Model Engineers, informs us that owing to unforeseen delays, the date of the Spring Power Boat Races has been changed to Sunday, July 21st, 9 A. M. to be held on Conservatory Lake, Central Park, New York City.

A fine Model showing part of a City with five intersecting roads and a traffic signal tower is in use in Berlin, Germany, for instructional purposes for the traffic police. Model vehicles are used and the traffic lights operate.

Have you all the back numbers of The Modelmaker? If not what do you lack?

"O" GAUGE MODEL LOCOMOTIVES MOTIVE POWER

By MR. F. W. ICKEN

(Continued from page 107)

Last month we finished the "chassis" for this model loco. With the "chassis" finished, you will note that the "hard" mechanical work has been attended to. From now on, the main work will be to represent the "picturesque" part of the loco; viz., the boiler, cab and other fittings, all of which are designated by the term "superstructure."

This superstructure could be built in various ways and with many different materials. The writer has seen boilers and cabs built up from tinplate, which when finished, presented a very realistic appearance. Of course, such material will not stand for much rough handling, but when ordinary care is exercised, should give good service. But for general service, heavier material is suggested, such as brass or galvanized steel from No. 24 to No. 22 gauge. (It is understood that a model of this type should never be handled roughly, that due care in picking up must be taken, so that the valve gear or other delicate parts are not bent or otherwise distorted. A true model engineer, one who really appreciates fine work, never "touches or picks up" any model without first ascertaining a suitable place to touch the model. And when the model is the property of another person, never handle it without first asking permission to do so. The writer trusts that this digression from the actual matter in hand will be pardoned, but he has witnessed many small "tragedies" to models just through neglect of the above caution.)

It seems that the building and mounting of a suitable boiler and cab, not only for this model loco, but for the average model, is a stumbling block for a good many modelmakers. Especially now that practically all modern locos make use of the tapered boiler. So it was decided that the boiler and cab, together with the main fittings such as the stack, domes, etc. should be assembled as one unit. Later it was decided that the running boards should also be a part of this "unit." Before placing the superstructure in position, the handrails and other fittings should be installed. The holes for the handrail supports are drilled and tapped. Screw in the supports nice and snug, using a small nail or piece of wire placed through the hole as a lever. Never use pliers on these small parts. Make sure to see that the supports are all in line. Shape up the handrail wire in the form of a "U" such as it will assume when in its final position on the boiler. Then start to install it by passing both ends through the first handrail support on each side of the smokebox. Gradually work it down into position, by passing it first through a support on

one side and then through a support on the opposite side. Extreme care must be taken that the wire is not bent. The handrail on front of smokebox, should be bent to the curve it will assume when in place on smokebox door. It can then be pushed into position. The steam reverse gear and the air pump are mounted on one bracket which passes under the boiler from side to side. The reverse gear is placed on the right side with the link facing forward. A screw placed up through the cross bar into the underside of the boiler holds this assembly in position.

The air and water pipes, together with the pipes coming down from the sand dome should now be placed in position. No. 18 copper or brass wire can be used for these pipes. They are soldered in position, using the minimum amount of solder for the purpose.

After these parts are all assembled on the boiler, it can be placed in position on the chassis. Make sure that none of the wires leading from the motor to the controller are pinched when the superstructure is in position. The superstructure is installed on our chassis by simply dropping it into position, the stud through cylinder block passing through a hole in underside of smokebox. A nut is placed on this stud, but left slack for the present. Under the cab, there is a vertical sheet, or cab support, which has two holes that will line up with two holes drilled and tapped in the chassis frame. After these two screws are in place, then the nut in the smokebox can be tightened up. Just make it nice and snug and not too tight.

This concludes the building of the locomotive. Next month we will take up the tender together with the painting and finishing. We will be able to illustrate the completed model in the next issue, and we are sure that our many readers will be very much pleased with the neat, business-like appearance of this little locomotive.

MODEL POWER BOAT ENGINE

By Mr. E. T. Middleton

The illustration on the front cover of this issue is from a photo of my engine made from a set of Stewart castings, which can be obtained from Alfred Paul & Son.

It is a single cylinder, double-acting, slide valve, launch type, steam engine. The castings are gunmetal, the flywheel of cast iron.

Particulars

Bore, ½".
Stroke, ¾".
Flywheel 1¾" dia. ⅝" face.
Crankshaft, 3/16" dia., 2" long.
Steam pipe, 3/16" dia.
Exhaust pipe, 3/16" dia.
Steam Valve, a Bathe 3/16" gate valve.
Height of engine, 5".
Width of engine, 3⅛".
Weight of engine 1½ lbs.

Cylinder is lagged with sheet steel, nickle plated.

All bolts are hex head and polished.

Engine is all polished.

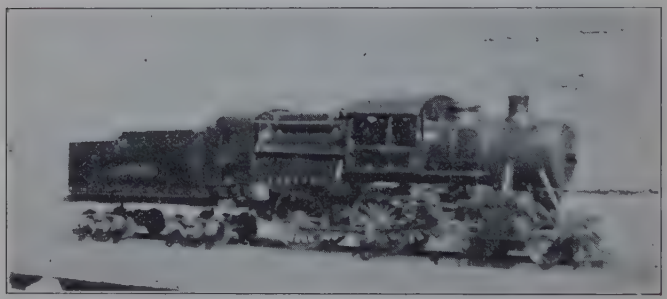
Tested under 50 lbs. air, it turned up about 3,000 R.P.M. Will run on 2 lbs. of air at fair speed. Suitable for a boat 30" to 36" W. L.

A good many of our Subscribers have changed their residence lately. Send us a postcard notifying us of your new address, so that we can correct our mailing list.

A STEAM WORKING MODEL D., L. & W. CAMEL BACK LOCOMOTIVE

By MR. E. D. BERGH

The original of this model is one of the rebuilt 440 Lackawanna camelbacks, known as the "900's". Some who read this description may have seen the big "970" and noticed a Baker gear thereon and ask why the Walschaerts on the model. The model is not entirely true to scale. It is built of some parts made for a different model and others made by myself. As originally built the big engines had some of the following dimensions cylinders 20" x 26" driving wheels 69", rigid wheel base 8' 6", wt. on drivers 104,500 lbs., heating surface 2,138 sq. ft., grate area 87½ sq. ft. I believe they are about the largest 440 engines ever built and have a tractive force of over 23,700 lbs. These engines originally had built up bar frames, D slide valves operated by an inside Stephenson valve motion through the usual rocker arms and had 4 bar crosshead guides. Most of them were rebuilt a number of years ago with superheaters and Franklin valve chests with outside admission piston valves bolted to the old valve seats. A few were more recently rebuilt with cast steel frames, inside admission piston valve cylinders, with 2 bar guides and outside Baker valve gears. One of these, the "970" took my fancy at the time



I was working on these engines and is therefore one reason for the model. Another reason is the fact that with a blow torch fire, you can still manage the throttle and reverse lever without burnt fingers, as these levers are in the forward cab, away from the heat. Also the rear cab and tender conceal the torch very well. I may as well add that while the torch makes plenty of roar outside, it is very quiet in the fire box and sounds like a blower. The model runs with great smoothness, has plenty of

power, steams quickly and looks quite like the original. A few dimensions are cylinders 5/8" x 1", driving wheels 3", truck wheels 1 3/8", rigid wheel base 4 1/2", boiler 3" dia. x 12" long, scale 1/2" = 1', track gauge 2 1/2". There is a complete equalized spring rigging, 4 driver springs with 14 leaves each and 2 truck springs of 10 leaves each. The fittings include throttle and reverse levers on right side of front cab, displacement lubrication left side of same, 2 try cocks, 1 blower valve, and 1 water feed valve in rear cab.

The tender contains the torch complete, and also the water tank and hand force pump. The boiler is steel tubing containing a central flue with many cross water tubes, and works very well with the torch. The valve gear is full Walschaerts, cut by hand from bar steel, even to the return cranks. It is squared up for a cut off of about 3/4 piston stroke in full gear, favoring the forward motion. The valves have about 1/16" steam lap and about 1/32" exhaust clearance and are set with very slight lead. Most of the other parts such as wheels, frames, cylinders, etc., are castings as in usual practice.

In conclusion I wish to express my thanks to my good friend F. D. Grimke, whose set of small tools was a great help in building the model, to the Murray Hill Trade School, to Mr. Fernald who took the photos and to my many other friends in the N. Y. S. M. E. whose advice and assistance was always cheerfully given.

QUERIES AND ANSWERS

P. W. W. Ohio—Would like to know the colors of the best heat resisting paints for model Steam boilers.

NEW YORK SOCIETY OF MODEL ENGINEERS

A General Meeting of the Society was held on June 25th at the United Engineering Societies Building in New York City.

It was announced from the Chair, that the Spring Race was postponed until July 21st. All competitors are to hand in their entry to Mr. Singer.

The Chairman tendered to Mr. Zimmer on behalf of the members and officials of the Society, a public apology for the failure to accept Mr. Zimmer's kind invitation. The apology accepted and Mr. Herreschoff ventured to remark that he hoped the invitation would again be extended to the Society.

The Financial Statement was read.

An Amendment to the By-Laws was read. Action upon which will be taken at the September Meeting.

An analysis of the membership was presented.

Mr. Dobler proposed, and seconded by Mr. Bender, that the Track Fund be cancelled and the surplus be put into the General Funds.

Mr. A. Bauer, Chairman of the Aviation Section announced that he would like to hear from any member interested in Model Aeroplanes. Mr. Singer was instructed to find out how many members are interested with a view of holding a meeting to further the interests of model aeroplanes.

As there was no further business, the meeting adjourned at 10:30 P. M.

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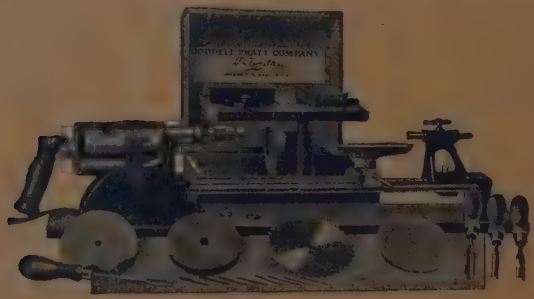

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VOL. VI, No. 8 August, 1929 10¢

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THE MODELMAKER

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OUR FOREWORD

Fifteen hundred and seventy feet in a minute; a speed of seventeen miles and fourteen hundred and eighty feet in one hour was the record made by Mr. Adolph Bosshardt's new gasoline engine powered model boat.

This gentleman has devoted more than ten years to the development of a model gasoline marine type engine suitable for a model speed boat, and during that time has built a number of engines, single cylinder, two-cylinder, and four-cylinder.

His latest engine is certainly a fine example of careful design and workmanship, and on her bench tests she gave excellent results.

His new hull was built from plans scaled down from the drawings of one of Mr. J. J. Hacker's famous gasoline speed boats. The workmanship and finish of the "Ann A" certainly deserve the highest praise. But in spite of her performance, easy starting, steady running and good clean get away she lacks the speed the builder had expected she would develop.

Perhaps after some slight changes in trim, or a different propeller, she may make a better showing. A slight change in the position of the hook of the tethering cord might makes a considerable difference as she seemed to pull hard on the cord while under weigh.

The writer believes that if she had been running free of the cord she would have made much greater speed.

The "Ann A" is a powerful boat and Mr. Bosshardt may find it necessary to give her a more powerful set of engines before she really shows what she can do.

There were to have been two other gas powered boats, one a new Elliott hull but the gas engine tried in her was not suited for her design. The other boat was out of commission.

There was still another boat expected powered with a steam turbine but she did not show up.

It is hoped that one or all of the last three boats will take part in the fall Speed Boat Races.

Of the steam powered boats two made an excellent showing and the other two should have done well but for blow torch trouble.

When writing for information, please enclose stamped and addressed envelope.

"O" GAUGE MODEL LOCOMOTIVES MOTIVE POWER

By MR. F. W. ICKEN

(Continued from page 135)

We are now ready to begin work on the Tender. The tender underframe consists of a "floor," with a "subframe" which carries the truck "king-pin," coupler for loco and provision for attaching any standard type of car coupler at the rear end. Steps are fitted at both ends of this "subframe."

The truck sides are brass castings. Bolsters are formed up from half-hard brass strip. Equalizing is effected by having one truck side pivot on a special screw. Sufficient play is allowed where truck is attached to the underframe to allow for the motion required when running over uneven track and in negotiating curves.

All the above parts are finished and assembled, ready for the Tender Body.

Tender Bodies are built up complete to incorporate the coal hopper and water tank, together with the following details: viz., hand rails at forward and aft corners and across back. A small ladder is provided at the back for gaining access to the tank top. A water filler and hand rails around edge complete the fitting on top of tank. The tender body is also completely finished ready for installation.

Either of the above units could be used in conjunction with a home built unit, as the tender body could easily be installed on a home built tender under frame, or vice versa.

The method of attaching the tender body to the underframe is as follows: viz., place the body in its proper position on the underframe, making sure that the body is central over the underframe. The body will project over the underframe at the sides, giving the correct appearance of the prototype. Hold the parts in position and "spot weld" in four places on each side, with solder. Use the minimum amount of solder and it will not be very noticeable when painted.

This practically completes the building of the loco and tender. An illustration, which gives some idea of what "we have been talking about" these past few months, is reproduced with this article.

Now the painting. Painting must be carefully done in order to secure a "clean" smooth finish. Contrary to the usual idea, the writer believes in following the old style coach finish in preference to the new quick drying paints and lacquers. Lacquer does have a place in the painting, but only on certain small parts. The first coat of "flat black" is made up from "black ground in Japan." Be sure not to get the color "ground in oil." Mix a small quantity of the black, which will have the consistency of a paste when purchased, with just enough turpentine to make a fairly thin paint. Apply this with a soft brush about ½" wide. Just dip the brush a "wee" bit so that not much of the paint is applied at a time. Start from the top and

work down. Flow the paint on and do not try to brush it too much. Make believe you are painting a full size loco, and do not try to paint the whole model with a few brush fulls. The superstructure should be removed from the chassis for the first three coats. The second and third coats will consist of Valspar "Flat Black," which should be applied the same as the first coat. This paint needs no "fixing" but should be thoroughly stirred before using. Allow at least 24 hours between coats and protect the model from dust at all times. Always clean your brush in turpentine as soon as you are through. Wipe brush dry with a rag. It might be best to follow this cleaning procedure before starting to paint. Never leave the brush stand in turpentine when not being used. You are liable to find that the hairs will start to fall out while painting the next time.

The chassis generally only requires touching up, and for this purpose, lacquer will be suitable. When the superstructure has received its third coat and is thoroughly dry, mount it on the chassis. Then give it its last, or fourth coat, using the Valspar flat black. Just go over those parts that are the most noticeable. Do not try to paint the underside of the boiler, because it is nearly impossible now, and the first coats have taken care of that detail.

Now your model is ready for lettering and if you are handy with a lettering pen, you should have no trouble. But most of us are not so gifted, so we have to use stamps. There are two ways to make use of these stamps, the first is to stamp right on the cab and tender sides the other, is to paint some thin white paper with the flat black (Valspar) paint and to stamp that paper, cutting it into small labels and pasting these labels in position. When varnished, these labels are not very noticeable. Furthermore, you have the chance of picking the best impressions, rather than depending on a "one shot chance." Of course, you can always paint over a poor impression.

If you do not want to varnish your model, go over the stack, paint smoke box and the cab roof with the flat black (first coat paint). This will give the correct prototype appearance. Otherwise leave these parts unvarnished, where varnish is used in finishing. Use a good quality varnish, and cut it down with turpentine. Use the same instructions as when painting, but be extra careful to put only a small quantity on your brush at one time and just "flow" it on. Do not try to brush it out. Allow at least 48 hours for drying. Also, be extra careful about dust when varnishing.

(To be continued.)

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 133)

Side Rods & Motion Work — These parts may be made either from solid steel, cast in nickel silver or malleable iron castings. The cast form has the advantage of eliminating a lot of hard work in cutting from solid and when finished up nicely leave little to be desired.

The main Rod No. 258 may be first filed up to dimensions and then the centers of crank pin and wrist pin laid off. Drill and ream both holes and press in a brass bush at crank pin end or "back end."

The side rods may be cleaned up all over, and the joint between back and front rods made and fitted. Do not fit this too tight, a little side clearance is desirable. Full size rods are backed off similar to sketch Fig. 43 and the same practice can be adopted on the model. The Knuckle pin passes through the inner limb of jaw and tongue with full diameter and is drawn up tight against the outer jaw by the nut and shoulder. Having made the joint and fitted the pin the two rods being coupled together, mark out the crank pin bush center and drill it same size as center hole in the jig you made for setting out bearing centers. Now, clamp the two rods to the jig with a plug in center hole to locate, and spot drill the front and back ends. Just drill a countersink with same size drill as holes in jig. Then take rods off and drill through with the proper size drill. Turn up the bushes about .001 larger than the hole and press them in. Note that the bushes stand out from rod 1/32" on inside. Drill oil holes No. 52.

Valve motion—Most of the links are a straight forward filing and drilling job. File the parts up close to dimensions as nothing spoils the appearance of a model as much as clumsy looking valve gears. Be careful to make the parts for right and left hand where unsymetrical. All parts are of nickel silver except the expansion link and die block. The former is best made of steel. Lay the contour and center lines out carefully on a piece of ⅛" thick cold rolled steel and drill a series of No. 15 holes along center line of radius of slot. Cut out the fins and carefully file to line using a narrow No. 2 pillar file for convex surface and a 4 inch No. 2 "Crossing" file, for concave surface. Finish out the surface by "draw filing" with a No. 4 file.

The back of the link is made square and the outer edge is to be 7/16" out; this is important. The next job is to make the trunnions. These are turned from a solid block of steel ⅜" thick. The sketch Fig. 44 shows the steps to be taken. The ⅛" opening should be a nice fit to link and the bottom should be exactly 7/16" down from center line. It will be now seen that when the trunnion piece is put on the link, the bearing centers will be on center line of slot.

Fig 43

Fig 44

Fig 45

Fig 46

Fig 47

Drill for the rivets, right through, then case harden the link by making red hot rolling in "Kasenit" and quenching in water. Polish up with emery cloth and then rivet on the trunnion. Finally cut away the superfluous metal as shown. The drilling of fork end of eccentric rod No. 960 had better be left till erection of gear. Lifting arm No. 1160 can first be drilled mounted on a mandrel and faced on both sides of arms, then filed to correct profile. It is important to obtain the profile of lifting arm as shown on drawing because the arm must clear the expansion link path for all positions.

The easiest way to produce the contour is to carefully set it out on a thin piece of steel or brass, then drill the holes, and cut out filing close to the lines. Put a piece of 3/16" drill rod in boss of lifting arm, slip the template over it, drill No. 44 holes; put a 2/56" bolt through one thus holding the template fast, then fix the lifting arm down to the template. The expansion link brackets are castings, the two halves being cast together. Proceed to finish up as follows:

First file out or mill the opening 7/16" wide, then file up the seating. Mark out for the bearings, place a piece of material between the two webs, hold in a toolmakers vise, square with base, and drill right through 5/32". Now, take the motion beam No. 763 and mark out the center lines 4¾", if this is not already done. Also mark the link bracket center line 7/32" from inside of webs. Clamp the bracket to the beam and spot No. 44 holes from those already drilled in beam. Take off bracket and drill No. 49 for 2/56" tap. Now the bracket can be sawn in two pieces down the center line. Mark the brackets and beam so that they can always be properly mated.

The expansion link may now be placed in the brackets and the inside of bracket eased out to allow the link to swing easily. The reverse shaft bracket No. 563 may be made. The castings supplied will be as Fig. 46.

To make the brackets right and left hand, cut off the foot on one side of one bracket and the opposite foot of other. Clean up the face and sweat together Fig. 47. The pair of brackets can now be filed up and drilled thus ensuring that the brackets are in line when they are screwed to the top of motion beam.

Next month the Boiler will be dealt with.

Mr. Joseph A. Chaguen, 311 School Street, Webster, Mass., is very much interested in model work, notably Model Aeroplanes and Models of Warships. He would very much like to get in touch with any of our readers in his locality with a view to an occasional meeting for mutual benefit.

Mr. A. L. Widener, 3047 Lawton Ave., Detroit, Mich., sends us a photograph, and a short description of his "O" gauge steam locomotive which he has just completed. He informs us that Mr. Birch recently tested it out on his track, with 125 lbs. of steam, and it operated very successfully. He obtained the finished cylinders and wheels from Mr. Birch, and he speaks very highly of Mr. Birch's workmanship.

THE BALTIMORE AND OHIO, JUNIOR

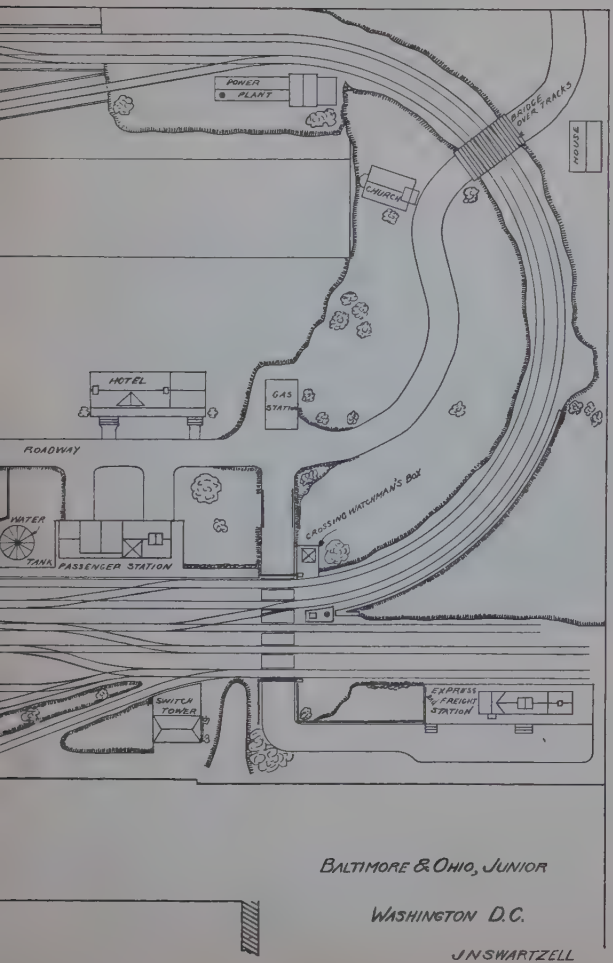
By MR. JOHN N. SWARTZELL

The Baltimore and Ohio, Junior, first came into being some twenty-five years ago, when a small boy saved up enough money to purchase a mechanical train and a few sections of toy track and since that time the system, being improved by experience and time has maintained it's existence in some form or another. The present layout is approximately ten years old and uses no equipment but what has been built in it's own shops except ten or twelve German built freight cars, which were purchased in 1908.

The road is done in quarter inch scale and is placed on tables three feet in height, covering an area of about 160 square feet. Rails are of brass T section, laid as a double road, on wooden ties, which are in turn placed on batten strips beveled on their outer edges to represent the railway embankment. Ballasting is accomplished with chicken grit, held in position on the slopes by means of shellac. The general arrangement is that of an oval having the necessary yard tracks taken off from the forward side. Crossovers are installed at several important points in the system enabling easy passage from one track to another. The entire surface of the supporting tables is contoured to represent a rolling terrain adjoining a mountainous section. At one end the road passes through a deep cut with rock and dirt embankments at either side while the curve at the opposite end, in order to give additional space and to lend an effect of distance, passes through the wall into an adjoining room and is covered in its entirety by a tunnel through the mountain side. The cut is spanned by a wooden highway bridge such as often seen in the rural sections, which carries the principal roadway over the railroad to a point where it merges into the background scenery. The background carries out the same general scheme as the contouring and was done by the author's brother, who has contributed many valuable additions to the road. It is painted on unbleached muslin and while it can in no way be classed as a masterpiece of art it serves effectively to conceal the bareness of the brick walls of the room.

It was not feasible, for lack of space, to have but one central town on the railway, therefore it seemed advisable to let this represent a division point. With this idea in mind the most important of the Company's buildings have been located at what is known as Fair River. This point takes its name from the river, shown very largely in the background but on whose banks it is, nevertheless situated. Here one finds roundhouse, locomotive repair shops, where all the motive power for the road is supposed to have been built, coaling and water facilities, freight and passenger stations, dispatcher's office, etc. The placing of these buildings may best be seen by referring to the accompanying sketch of the general layout.

MILL
HOUSE
FARM HOUSE
FARM HOUSE
COAL DOCK
ROUND HOUSE
OFFICE
TURN-TABLE
SHOPS


POWER PLANT
BRIDGE OVER TRACKS
HOUSE
CHURCH
HOTEL
GAS STATION
ROADWAY
WATER TANK
PASSENGER STATION
CROSSING WATCHMAN'S BOX
SWITCH TOWER
EXPRESS & FREIGHT STATION
BALTIMORE & OHIO, JUNIOR
WASHINGTON D.C.
J.N.SWARTZELL

The shop buildings are built in half section only, placed directly against the background at the end of the room and in reality serve more as a valuable piece of scenery than for any practical purpose. In front of these stands the roundhouse with stalls for four locomotives. Space does not permit the use of a larger building. The roundting its power through a horizontal shaft and several sets of gears.

The main line switches employed in the three tracks directly in front of the station are manually operated from a twelve lever frame housed in the tower, which also contains the train dispatcher's office and division headquarters. For convenience

house simulates concrete construction with slag roof and is supplied with drop pits under two of its tracks for use in caring for minor locomotive repairs. The house is served by a scale 102 foot turntable, intended to represent the Bethlehem twin span non-balanced type and is capable of holding the largest locomotive the road ever expects to possess. It is manually operated by a crank placed at the outer edge of the pit transmitin operation the tower is removable as a whole from the lever frame. The levers are brass castings with correctly shaped quadrants and are arranged for locking equipment although thus far none of the latter has been applied. This device is, of course, not to scale. It is contemplated to install, at a future time, electrically operated signals properly interlocking with these switches. In the right

(To be continued.)

THE NEW YORK SOCIETY OF MODEL ENGINEERS

The Spring Race of the New York Society of Model Engineers held on Conservatory Lake, Central Park, Sunday, July 21, 1929, was the most successful race the Society has held in a long time. There was a large and interested crowd and from start to finish the variety of boats held every one's attention.

The winning boat was Mr. Adolph Bosshardt's gasoline driven speedboat, a photograph of which is shown on the front cover. This boat is a scale model of J. J. Hacker's design "Miss A. P. B. A." specially designed for the gold cup races. She is built to a scale of 2" to the foot, which gives an overall length of 52" by 12" beam. The boat and engine are built to scale in every possible way, there being practically no deviation from true scale even in fittings, seats, etc. The workmanship throughout is excellent and Mr. Bosshardt deserves a great deal of credit for this job. Mr. Bosshardt also ran his "Clifton V" "Hacker" type speedboat. This performed as well as last year, making approximately the same time.

(Photo by Mr. Tenniswood.)

Reading from left: Messrs. Grimke, Bosshardt, Holt, Zimmer and Habl.

The Racing Committee consisted of H. M. Oliver, Chairman; W. E. Spon, Time-Keeper and Messrs. Tenniswood, Herreschoff and Dobler—Judges.

There were six entries as follows:

Gasoline Engine Powered.

"Ann A" owner Mr. Adolph Bosshardt, Jr.. built from lines of a Hacker Runabout, scale 2" to 1' of 3-ply mahogany, length O. A. 52", beam 12", rounded stern. Engine 4-cylinder, 4-cycle, Bosshardt gasoline overhead valves, water cooled, cylinders 1¼" bore by 1¼" stroke. 2 bladed propeller 9" pitch.

"Clifton V" owner Adolph Bosshardt. Jr., Displacement 24 lbs., Speedboat design, built of 3-ply mahogany, 1/16" thick. Length O. A. 40", beam 12". rounded stern. Engine Bosshardt single-cylinder, 4-cycle water cooled overhead valve, cylinder bore 1¼" by 1¼" stroke, 3 bladed propeller.

Steam Engine Powered

"Blackbottom" owner F. D. Gimke, Displacement 22 lbs., Elliott Speedboat design, built of mahogany, Length O. A. 39", beam 11", square stern Engine rebuilt Bohaboy 2-cylinder, single poppet valve, water cooled, with oil pump forced lubrication. Water tube boiler, gasoline torch.

"F Z 1" owner F. C. Zimmer. Displacement 12 lbs., Boucher hull, speedboat design, constructed of maple. Length O. A. 42", beam 9", square stern Engine rebuilt Stuart Turner M T B 2-cylinder single acting, bore ¾" by ¾" stroke, Tubular boiler 13" long, 16 tubes, 5/16", Gasoline torch 1¼".

Not named. Owner Calvert Holt. Displacement 16 lbs. Elliott hull, Length O. A. 42", beam 10½", square stern, Engine Habl 2-cylinder, piston valve, ball bearings, cylinder bore ⅞" by stroke ⅞" water tube boiler\ blow torch 2⅛".

"Vinabonna" Owner N. Habl. hydroplane 1 step, Elliott hull of mahogany, Length O. A. 39¾", beam 13¼", engine 2-cylinder Westinghouse, single acting, piston valve, mechanically operated oil pump 60:1, bore ⅞" by ¾" stroke, fire tube boiler 2¾" flue tube, 9 tubes ¾" dia., welded, gasoline torch 1½", 2 bladed propeller 10" pitch.

Results

"Ann A" first trial, 5 laps on 50 ft. cord. 60.3 8/10 sec. Second trial, 5 laps, 60.6 sec. Third trial 5 laps, 60 sec. (Winner.)

"Blackbottom" First trial 3 laps on 50 ft. cord, 35 sec., on fourth lap, boat turned over and foundered (salvaged). Second trial, 5 laps, 60.3 4/10 sec. Third trial, 5 laps 60.2 sec. (Second).

"F Z 1" First trial 5 laps on 50 ft. cord 60.2 sec. Second trial 5 laps, 60.3 8/10 sec. (Third).

"Vinabonna" First trial 4 laps, on 50 ft. cord, 60.23 sec., did not finish. Second trial ran one lap only, blow torch trouble.

"Clifton V" First trial 5 laps on 50 ft. cord 60.9 sec. Second trial, 5 laps 60.7 2/10 sec. Third trial 2 laps only, 30 sec. On the first trial this boat ran 45 continuous laps and was then stopped. Last year she made a record of 54½ continuous laps and was then stopped. Believed to be the longest run of any gas driven boat in the U. S.

Mr. C. Holt's entry was tried three times, but each trial no result owing to blow torch trouble.

This series of races was considered the best mornings performance of any series of races ran off by this Club.

The final Power Boat Races will be run off in September for the Cup.

"THE MAD HATTER"
A Model American Eagle Biplane

By MR. CHALMERS K. STEWART

The plane illustrated on these pages is a twenty-four inch model American Eagle biplane which was built by me during the course of the last eleven months.

This model marks my first effort at model airplane building during an enforced absence of nearly two years, two years during which model airplane building made greater advances than in any other period of its history.

Increased interest in aeronautics on the part of the public has stimulated model airplane building to an unprecedented degree; the inevitable result has been the fabrication of many fine models. While the tempo of model airplane building has increased, innovations in design and construction have been few, so that the criterion by which a model is to be judged is simply refinement of detail. Conventional methods of construction are apparent; striking differences in building are not found, for all the models are of the familiar built-up variety commonly designated as "the stick and brad type." Remembering that all scale model planes are basically the same, I shall confine my discussion to an exposition of the detail work on the plane—and to points of difference between my model and the conventional ones.

The plane in question, though not finished, won fifth place in the second national contest of the Airplane Model League of America in competition with some 150 other contestants. The plane is built to no convenient scale, being scaled down to the requisite twenty-four inch span in accordance with the contest rules. Finished in blue and gold, the plane presents a very trim appearance; the wings, cowling, stabilizer, fin, and stripe down the side are gold, while the rudder, fuselage, and struts are navy blue. The wheels are vermilion to set off the whole plane. The interior of the plane is finished in royal blue and apple green with spatter work as on the prototype. Before lacquering the plane, all the china silk covering was given from three to four coats of undiluted airplane nitrate dope.

The interior of each cockpit is made as complete as the full-sized American Eagle plane, having: working controls, dummy instruments, first-aid kit, bucket seat, safety belt, Very pistol, cupboard, stabilizer control, Pyrene, shutter control, and throttle. The stick works in the conventional manner, operating the flippers by the customary cables and actuating the ailerons by means of push rods. The rudder bar operates the rudder in the usual manner.

The instruments in the cockpit were built up out of black cardboard and celluloid from film negatives. The instrument design was drawn on the cardboard with white ink and then a circular piece of celluloid was glued on to simulate the glass in the full-sized instrument. A dummy compass for mounting in front of the dashboard was also

built up in this manner by an amplification of the process. The control stick was made from a bent piece of hollow brass tubing with a ball from an electric light socket pull chain as a knob All the fuselage structure tubing that was visible on the real plane was made from round wood on the model. The Pyrene was constructed from a dowel covered with gold paper to simulate the brass original; a suitable handle and nozzle was put on and the whole appropriately lettered. The bucket seat was made from silk-covered cardboard, bent and cut to the required pattern. Safety belts were made from ribbon dyed khaki with a small safety catch to secure verisimilitude. The first-aid kit was made from a solid piece of wood, painted and glued to the side of the fuselage.

The wings were built in the conventional manner with one spar, solid leading edge to secure the effect of the plywood leading edge of the original, and ribs made from one-sixteenth inch veneer. In order not to obscure the effect of the plywood leading edge on the under side of the leading edge, it was necessary to cut out part of the solid balsa leading edge to obtain the effect of the ribs being prolonged to the entering edge of the wing. One-thirty-second inch steel drill rod formed the trailing edge of the wing. To heighten the realistic effect of the wings further, wing tapes were glued over each rib after the wing had been covered and doped. In the lower wing panels are peek holes through which the aileron bell cranks may be inspected. The ailerons are of solid wood, as is the rudder, elevator, and stabilizer. All control horns were made from sheet aluminum.

All cowling was made from ordinary drawing paper, a pin with a rounded shank being used to form dummy bolt heads by punching from the back of the cowling; the streamline headrest was also made from cardboard. Windshields were made from photo negatives with the emulsion scraped off; they were fastened to the model by means of tabs. The nosepiece directly back of the spinner was made from solid balsa as it was deemed too difficult of construction for the very limited time available. The propeller is made from wood; it is painted a duraluminum color and has the Standard Steel Propeller insignia on it. Exhaust stacks made from rolled paper tubing painted to represent overheating, rusting, and exhaust discoloring.

The door in the fuselage works, having a bolt that slides into the upper longeron when the door handle is turned. The cupboard door in the pilot's cockpit works also.

The padding around the cockpit rim was made from radio spaghetti tubing and secures the intended effect quite well.

The landing gear and tail skid both work, with miniature shock cord as the shock absorbing agent. The landing gear is of the split type; it afforded much interesting though tedious work when it was being built. The wheels are solid wood appropriately painted with the tires sanded dull black to secure realism.

To strike a new note in model airplane construction is difficult not to make your model different from others is to attain mediocrity. The day is past in which model airplanes are judged as to their excellence merely

by the fact that they look like real airplanes. Finish and fidelity to prototype are coming to occupy their rightful place in model aircraft building. If my model has any virtue, it is in the fact that it is indicative of the change that scale model building is now going through.

Too much credit cannot be given to Mr. Oscar Schuwendt for his pioneering work in first publishing authentic plans that could really be dignified by that name. To him I owe the occasion for my entering the fascinating field of scale model building.

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THE CHICAGO SOCIETY OF MODEL ENGINEERS

Schedule of future meetings. (Subject to change): August 8, Speaker: John Matthews. Subject: Model Railway Construction and Operation.

August 22—Model Night.

September 12—Speaker: Julian W. Keenan. Subject: Foundry Work as Applied to Models.

September 26—Model Night.

October 10—Speaker: Elmer B. Tolsted. Subject: Engineering Layout of a Model Electric Railway.

October 24—Model Night.

November 14—Speaker: Geo. J. Huss. Subject: Wood Finishing.

November 28—Model Night.

December 12—Speaker: Tom A. Ahlsgaard. Subject: Thermo-dynamics of Internal Combustion Engines.

Meetings are generally held in Room 921. Kimball Hall, s.w. corner Jackson Blvd. and Wabash Ave. Information regarding any possible changes in the above schedule, or regarding the Society's activities, may be had from the Secretary, S. C. Swanson, 5510 West 64th Street, Chicago, Ill.

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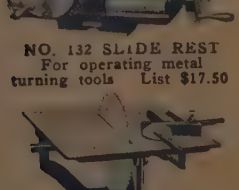

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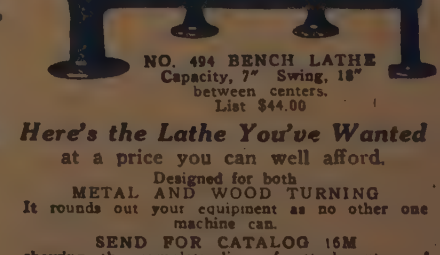

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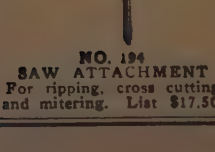

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VOL. VI, No. 9 September, 1929 10¢

A view of one of the stations of Mr. John N. Swartzell's Model Railway System. See Page 164.

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THE MODELMAKER

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OUR FOREWORD

In another part of this issue will be found the advance notice of the forthcoming Exhibition of Models, including Trade Exhibits of models, castings, supplies, tools, lathes, and other materials used in Modelmaking.

The New York Society of Model Engineers are aiming to make this a comprehensive Exhibit, and are offering space for Models built by non-professionals, whether Members of this Society or not, residing in any part of the U. S.

There will be a number of Competitive Exhibits, for which prizes will be awarded.

The location of the Exhibition is a very central one, and easy of access from all parts of the City and Suburbs. It will be open for one week from 10 A. M. to 10 P. M.

The last Exhibition held by this Society was a very successful one, but this one will be much more representative of the Modelmaking Industry of the United States.

Mr. Bruce E. Alter, 154 "C" Street, Johnstown, Pa., writes that he is very much interested in model railway work, and that he has just finished a heavy switching engine of the Conemaugh & Blacklick Railroad, and promises to send us a photograph and description of it later. He has just started on the construction of a four foot model, of the Pennsylvania Nautical Schoolship Annapolis for a friend. He would be glad to get in touch with any of our readers interested in model work residing near his locality.

Mr. E. L. Luke, 2842 Vista St., N. E., Washington, D. C., was in New York and dropped into our office for a chat. He is very much interested in Model Power Boats, and has just purchased a Wall Gasoline Engine, ready to run from Mr. Lockwood, to power one of his hulls. He would very much like to get in touch with any of our readers located in or near his city with a view to a friendly chat for mutual benefit.

Have you sent us the renewal of your subscription? Please let us have it at an early date.

THE BALTIMORE AND OHIO, JUNIOR

By MR. JOHN N. SWARTZELL

(Continued from page 152)

foreground stands the building used as combination freight and express office. This is served by three stub tracks for holding cars in process of loading or unloading.

gines are equipped with scale 72 inch drivers while the two remaining have wheels equivalent to about 64 inches. Boilers are made of aluminum castings with cylinders of the same material,

Five Atlantic type locomotives make up the present stud of motive power. These use electric drive and were all built in the Company's shops. While these are all of similar design, no prototype was followed closely in their construction. There is just sufficient similarity in their appearance for one to know at a glance that they all belong to the same road. Three of the en-

cabs, pilots, and other appliances being made from brass and copper stock. For the sake of simplifying construction, commercial motors with alterations to suit the particular locomotive, have been employed. Each engine is capable of pulling five cars very nicely. Direct current supplied by a motor-generator set at about ten volts is used for power purposes. The

wiring of the system is such that each track may be used separately or by means of a switchboard the whole outfit may be operated from a single control switch.

The rolling stock of the road comprises fourteen pieces of passenger train equipment in addition to the ancient freight cars before mentioned. The latter are scheduled to be replaced by modern scale stock as soon as time permits. The passenger equipment consists of six Pullmans of various types including observation, combination baggage and club, chair and sleeping cars, together with dining, mail, baggage, express, coach and express refrigerator. There is one official car for use of the president or other high-up representatives of the Company, which was converted from one of the roads earliest dining cars and is fitted at one end with narrow vestibule while the other has an observation platform. With exception of two or three of the above cars all are mounted on six wheel trucks and represent fairly modern equipment. Car construction is of wood with exterior fittings such as steps, brake wheels, hand rails, ventilators and the like of metal.

As in real practice, continued efforts are being made to improve design and methods of construction and experience has truly proven the truth of the saying, quoted so often, that no matter how complete a model railway may be, it is never really finished.

Mr. Charles J. Francois, 2819 Cortelyou Road, Brooklyn, N. Y., is interested in model locomotive building, and would like to get in touch with any of our readers interested in this work, residents of Flatbush.

Mr. Kenneth S. Graves, 871 Ackerman Ave., Syracuse, N. Y., writes us that he has just finished a model of Donald McKay's famous clipper ship "Sovereign of the Seas." It is built to a scale of ⅛" to the foot. The hull is built up by laminations of mahogany with oak bulwarks and decking. It measures 39" O. A. 24" from keel to truck. 6" beam. All spars are workable. He spent a year and a half on this model which contains 3,200 parts. From the photograph it certainly looks like a fine piece of work. He says he thinks he will start in now upon Mr. Coventry's famous model of the B. & O. President Washington Locomotive.

Mr. E. M. Dayton, 114 Edmunds Street, Lynbrook, L. I., N. Y., is planning out a model railway system, and would like to get some information on scenic effects. No doubt some of our readers who have already developed their own model railway system, would be glad enough to help out by sending us in a description of any scenic effects they may have designed for their own system with photographs that we could use for future articles, and we shall be glad to give them full credit for the information.

Mr. Thomas Mace, 192 Division Street, Derby, Conn., dropped in to see us while on a visit to New York. He said he was specially interested in the construction of Models of sail boats and old time sailing ships, and that he would like to get in touch with any of our readers, who are interested in this class of modelmaking, with a view to an occasional meeting for mutual benefit.

"O" GAUGE MODEL LOCOMOTIVE, MOTIVE POWER

By MR. F. W. ICKEN

(Continued from page 145)

While the standard passenger locomotive on American Railroads of today is the Pacific type, there are still a good many of these little American types locos in use on branch and local Main line service. Naturally, the hauling power of an American type is far below that of a Pacific, even in model form, but it makes a very handy type for light trains. This model will haul a train consisting of three "short" coaches very nicely.

There is more "power" than can be used as the loco itself is too light for any heavier loads.

It has been a great pleasure to develop this model because the writer is an ardent "motive power" model maker interested in all forms of model transportation. During the last few years he has built model locomotives representing nearly every known type, both steam and electric outline. Some marine installations have also been made, using these standard motors, which have been very successful.

The writer has prepared a list of models to describe from time to time, which he thinks, will prove of great interest to model railroad men. Several different forms of motive power, as used on modern railroads, will be covered. There will also be some interesting developments to describe for the ½" scale men. The writer would be interested to know if there are many men using the Toy Standard gauge of 2⅛" who would be interested in a model steam outline locomotive? Thanking the many men who have written the writer and offered valuable suggestions, he begs to remain, An Ardent Motive Power Fan.

The writer has done some work in half-inch scale, particularly the building of electric motor trucks suitable for installing under MU or Gas Electric type passenger coaches. Through error, the illustration of these ½" motor trucks was given in the last issue instead of the illustration of the completed P & R loco. This month we give the illustration of the P & R loco, and by reference to the last issue, one may gain a good idea of the motor trucks about to be described.

A design was wanted suitable for the average Interurban car

or Gas Electric Coach such as in great use on the railroads today. After making due inquiry, it was decided that the truck built by the J. G. Brill Co., known as their MCB No. 27, having a wheelbase of seven feet, would be one of the most suitable.

Plans were accordingly obtained from the Brill Co., and the illustration in last month's issue gives an idea of the result.

These trucks are all ready to install, either equipped with motor or as a trailer truck. Generally, in this scale, the outside third rail is used, so they are fitted with "outside" shoes accordingly. The truck has "leads" or flexible wires coming from the various necessary points of the motor, to be connected to a suitable "block" mounted under the car floor. From this "block" leads are taken to a controller, giving forward and backward direction in addition to a neutral position. For a very powerful model, or in a light loco, two of these motor trucks could be installed. Each truck is capable of handling a body weighing about seven to eight pounds and at least one trailer weighing twelve pounds. On a line, having practically no gradients, two light trailers could be handled.

The main specifications are as follows, viz, Motors universal for either direct or alternating current, DC voltage 12, AC voltage 15 to 17. Seven section armatures and commutators. Copper carbon brushes, which require practically no attention, are used. These are not to be confused with straight carbon brushes, as the copper gauze binding the carbon in these brushes, forms a perfect conductor. The only good point for plain copper brushes, is their good conductivity, but they need extremely good lubrication or they have a tendency to cause excessive wear of the commutator. Field and armature stampings are the highest grade steel that can be obtained for this purpose. Shafts are all ground steel. Motor bearings are bronze, while all other trucks and "jack shaft" bearings are brass. All bearings are of substantial size. Gears are machine cut from brass. Side frames are castings, with real equalizer springs inserted. Equalizing however, is effected by pivoting the whole truck frame. Binding bars are at each end of the truck frame to prevent any tendency of the frames to spread. The entire truck is very flexible in operation. Wheels are cast iron, turned to close limits, and as near the real wheel in appearance as possible. The motor drives one axle and a high tensil steel chain transmits the power to the other axle. The chain used will not stretch after many "miles" of service. It forms the most flexible means of coupling both axles.

Outside third rail shoes are mounted on hard wood blocks attached to the side of the equalizer on each side of the truck.

The trucks, when used with the special body bolster supplied, when mounted in place, will not protrude more than an eighth of an inch above the inside of the car floor. They could be built for the 2½" scale track, or Standard Toy Gauge, but on account of the powerful motor used, would have to extend above the car floor inside for possibly ½".

Different types of frames could be supplied so that the trucks would be suitable for say an Oil Electric loco. A loco fitted with two of these trucks, and properly weighted down, should

handle loads of from thirty to forty pounds. The working voltage could be arranged for either twelve or twenty-four volts DC.

Small trucks, suitable for "O" gauge, are built using the same type of frames but for eight foot wheel base or two inches. The motor is either mounted directly on the truck or in the car body. In the last mentioned case, a special drive is used between the motor and the transmission built in the truck. Several varieties of the above trucks will be covered shortly.

And so much for the present. We will be along soon with some more ideas for both the "real electric man" and the one who wants steam outline models.. Thanking the many men who have written the writer offering valuable sugestions, he begs to remain, An Ardent Motive Power Fan.

Mr. Robert L. Hornbeck, 1317 Hopkins St., Berkeley, Calif., writes us that he has just completed a model gas engine, four cycle, 1 5/32" by ¼", water cooled, which he has constructed entirely without castings. He has tested it out and it runs very successfully. No doubt he will be very pleased to show this model to any of our readers.

We have just received a very attractive little illustrated catalogue put out by the Cleveland Model & Supply Co., describing the goods they have for sale for the construction of model airplanes. Anyone interested in this subject should send 10 cents and get a copy of this catalogue for their file.

When writing for information, please enclose stamped and addressed envelope.

BOOK REVIEW

Railways of Today, their evolution, equipment and operation by C. J. Allen, M. Inst. T., A. I. Loco. E. xvix 400 pages, with 36 single and two page colored plates, 164 page plates and 25 diagrams, 6½"x5", cloth $5.00.

The work is arranged in four parts as follows: The Track. The Motive Power. The Trains. Railway Operation, and Appendices of notable engineering features, locomotive types, classes and dimensions, fastest and longest train journeys of different great railway systems of the world. Some of these famous trains are included among the colored illustrations. This is a work that will prove of considerable interest to railway men as well as model fans.

Mr. B. A. Fuller, 3830 43rd Street, San Diego, Calif., has kindly sent us several photographs of a very fine model of a steel truss railroad bridge, representing a 300 foot span which he has constructed for his "O" gauge railroad system. It is laid with double track, is 6'3" long, 9½" wide, and 16" high at the center and is composed of 2370 separate pieces of metal, not including track, and has successfully held up over 500 lbs., without any deflection. It represents the C. & N. W. R. R. bridge across the Mississippi River at Clair, Nebraska. It certainly looks like a very fine piece of work, and occupied nearly two years of the builder's spare time. Mr. Fuller would be very pleased to hear from any of our readers, living in his district, who are interested in model railway work, with the object of occasional meetings for mutual benefit.

HALF INCH SCALE MODEL
B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 148)

Boiler—The first job is to prepare all plates, tubes and stays, and do not attempt to rivet anything together permanently until all fitting has been accomplished satisfactorily. Proceed as follows:

The barrel which is of 3½" hard drawn copper tube should have the ends turned off square and to dead length. To do this, turn up two wood plugs a good fit in the tube and tap in lightly. Now the tube can be mounted in the chuck, and the tailstock center brought up to support outer end. Face off one end, reverse end for end and bring to correct dimensions. An inner liner must be sweated to inside of barrel under steam dome. Cut out a disc 2 inches diameter of 1/16" copper. Bend it to 1⅝" radius and sweat it in 2-7/16" from firebox end. Do not cut any hole.

Next, take the throat plate casting, bolt to face plate of lathe and turn the flange a good fit to inside of barrel, Fig. 48. Then file up the wrapper plate flange, and clean up the surface where mud ring bears. The "back head" is a flanged copper plate for which a hard wood "former" must be made or one in cast iron purchased. Cut the copper plate out to dimensions given by Fig. 49. Drill two holes anywhere within the fire hole space, anneal the plate well by making red hot and quenching in cold water, then screw down to the former. Now beat the edge of plate down a little at a time with a soft hammer or wood mallet. Go all round the edge. That is, deliver one blow at bottom say, advance a little and strike again until you finish at opposite corner. Repeat this process till the flange is snug to the "former." You will find that the plate hardens as the flanging proceeds and it will be necessary to re-anneal three or four times during the operation. This particular plate is a simple job, and will take less time to make than the "former," but care spent on the latter is well repaid by the resultant accuracy of plate.

The above note will also apply to the flanging of inner firebox plates with this further hint. The firebox plates have small radius corners connecting two straight edges and it will be found that as the flange is formed, the metal of corner grows out considerably longer than the rest of the flange, See Fig. 50, and there is a strong tendency to buckle. This little trouble can readily be overcome by clipping back the superfluous metal before resuming flanging.

To sum up. the royal road to flanging is (1) Keep the plates soft by annealing, (2) Light blows evenly distributed and steadily advanced along the edge, (3) In sharp corners or irregular flange, keep the flange of even depth.

Having made the backhead, clean up the mud ring to dimensions, and tin it inside and out.

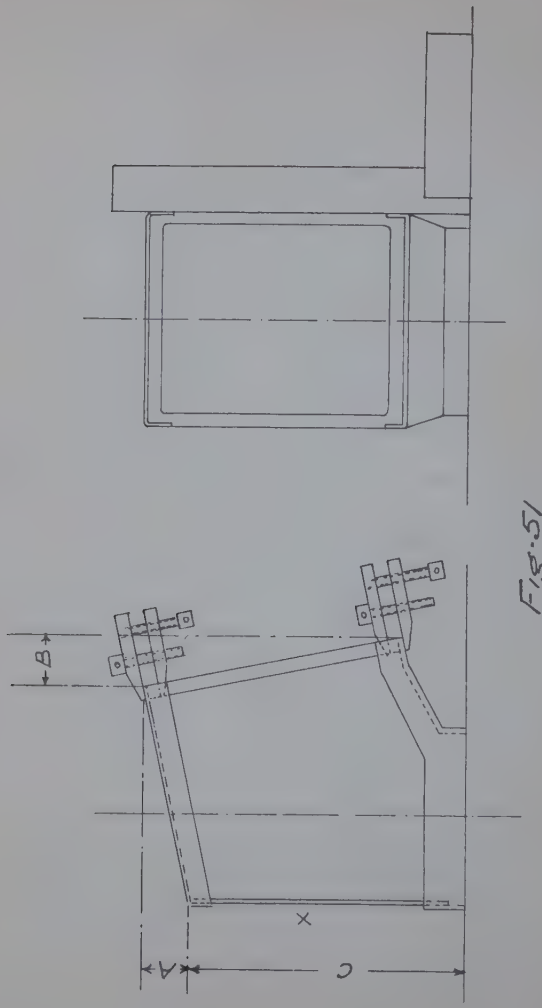


Fig. 51

Now take the throat plate and clamp the mud ring to it and do the same to backhead. Stand the whole on a surface plate and check over for dimensions a, b, & c. If not correct to drawing, adjust the edges of mud ring, remembering that a slight alteration here will make a considerable difference at a & b. See that sides are square and when all is satisfactory "tack" solder the two plates to mud ring. Just a spot of solder is all that is needed to hold temporarily and solder in a strip of any convenient size brass at x to give the structure some stability. Now you have a skeleton outer firebox upon which a piece of stiff paper may be laid, and trimmed to the edges. This will produce a perfect template of outer wrapper. Mark the center line on top, also center line of barrel on both sides. This is easily done with the square while the firebox is on surface. Mark out the centers of stays and rivets from these lines, then glue the paper in two or three places to a piece of 1/16" copper. Prick punch all holes and drill, then tin edges both sides and round all stay holes. Rivet holes are to be 3/32" drilled and stay holes drilled No. 39 for No. 5.40 tap. The wrapper may be bent around a piece of wood turned 3⅜" diameter, then placed in position on the "skeleton." See that it is a snug fit all around. Clamp to mud ring and drill through to backhead, mud ring and throat plate. Now take all apart. Flange up the inner firebox plate and drill for the tubes, Fig. 52, line up to mud ring on inside in the same way as described above, cut a paper template then the firebox crown and side sheet, but this time do not drill stayholes nor the holes along mud ring. Only the holes connecting the flanged plates to sheet are to be drilled now.

Tin the sheet all over both sides, then bend over a piece of wood shaped to top of firebox, apply to flanged plates and drill the rivet holes. Rivet up. Put mud ring on "tack" solder in one or two places and drill rivet holes in sheet using the mud ring as a jig. Clean up the fire hole ring casting, cut the hole out in backhead, drill rivet holes, sweat the firehole ring in place on backhead and drill through.

Now, all is ready for riveting up the firebox. First rivet the wrapper to the backhead then to the throat plate, then the barrel to the throat plate. Be sure that all joints are tinned before riveting. Next, slip the mud ring over the inner firebox and hold it in place with four loose pins placed in rivet holes on inside. Slide the whole unit in place in wrapper. If it will not go up far enough to permit of rivet holes lining up, look at the firehole ring. It may be bearing hard against the inner firebox. Rivet up along the mud ring, all around and drill right through the holes around firehole, and rivet up with round head inside and countersink heads in backhead.

Flange up the smokebox tube plate, drill holes, fit liner and sweat. Drill for ¼" steam pipe and grind in the ring No. 773. Then tin flange, put in barrel taking care to get the steam pipe hole on the vertical center line, drill holes and rivet up.

The rivets at top over superheater must have their heads well flattened to clear the superheater header. The tubes can now be fitted and expanded at front end and silver soldered or expanded with a drift in the firebox.

The boiler is now ready for

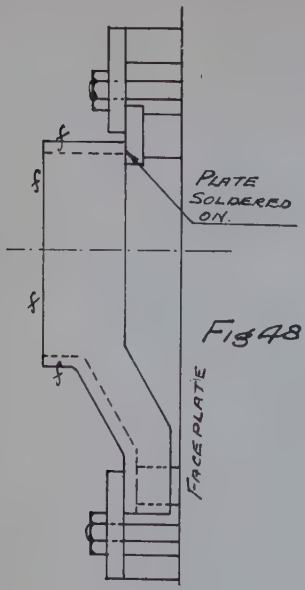


Fig 48

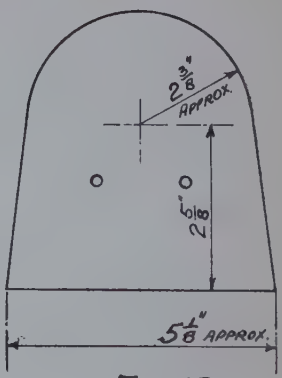


Fig 49

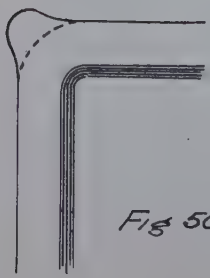


Fig 50

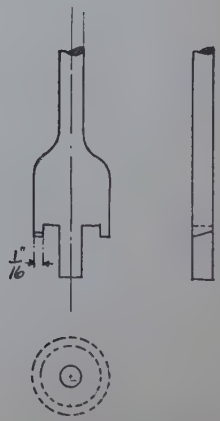


Fig 52

staying. To make the stays take lengths of ⅛" Tobin Bronze, put in the chuck and run No. 5-40 die over up to the jaws, pull the rod out another three inches or so without removing the die and run the lathe on slow speed. Repeat the process until the rod has been screwed up to the last ½" or so left in chuck. Cut this off. Use soap or soda solution while threading as the die will run hot. Lard oil is good but objectionable in this case as we need to "sweat" the stays later.

Now, drill right through holes in wrapper into firebox tapping drill No. 39 for 5-40 thread. Tap all the stay holes, those on sides of firebox can be tapped right through from outside as the tap is long enough to permit this. The crown sheets can be tapped from outside wrapper and inside firebox. If the thread is not continuous in outer and inner plates, the maximum error will not be enough to prevent the stays being screwed right in both plates.

In full size boilers, of course, where stays are from ⅞" to 1⅛" in diameter, the thread in inner and outer plates must be continuous, hence the use of special long taps called "tapper taps" that go through both plates at one time.

Now, we are ready for staying. Clean off any burrs around the holes, take a length of the screwed bronze rod and hold in chuck of a hand brace. Screw in until about ⅛" is protruding on inside of firebox. Cut stay off ⅛" from outer plate with a pair of cutting pliers or jewellers saw. Do this for each stay, then screw a nut on each end. It is good practice to tin the nuts before putting them on the stays. To do this, melt some solder in a ladle, dip the nuts first in soldering fluid (No korode is good), then drop them in the solder. Let them stay a few minutes, take out and shake off the superfluous solder.

The boiler proper is now practically finished. Cut out the firehole in inner firebox by drilling around close to the ring and file smooth, then go over all the joints with a torch or blow pipe or even a good Bunsen burner. Apply the flame to all joints and stays serving in extra solder if necessary and running around all with a soldering iron. Use plenty of soldering fluid. Do not carry out any sweating or soldering jobs in proximity to good tools or they will be rusted by the fumes. If you must do all your work in one place, then put away all tools and cover up your lathe.

Now it will perhaps be noted that up to now there is only one opening in the boiler, namely, the steam pipe hole in front. This would be a good time to test the boiler under hydraulic pressure, but before doing so, a small amount of preparation is necessary. First the hole for steam pipe must be covered and the best cover to be found is the superheater header itself before the steam pipes are fitted. Therefore, take the header casting and face up, then drill the ¼" hole at back. Be careful not to break through, then drill the No. 30 holes for No. 5-40 brass screws. Place a piece of ¼" drill rod in the ¼" hole, slip the jointing ring over, flat face to header then insert the whole set into the ¼" hole in front tube plate. Level up spot drill No. 30 holes, follow with No. .39 and tap No. 5-40 into front tube plate. Put a smear of graphite and oil on screws, also on jointing ring.

Next drill and tap the holes marked "check feed connection"

also "turret" the former 5/16"—32 and the latter 3/16"—40. Make two brass plugs of any odd piece of brass, one drilled to receive a pressure gauge connection, the other drilled through ⅛" and fitted to receive either a type pump rubber hose or a 3/16" copper pipe connection. Fill the boiler up with warm water till it flows out of top, put in the plugs, fill up the type pump with water and press on the plunger till 120 lbs. is registered. Inspect all stays and joints for any weeping. If there is, empty the boiler and go over the offending joint with the torch and soldering iron. If many little leaks are showing time is saved by pumping up a few pounds air pressure, then plunge the whole boiler in a tub of water. The issuing bubbles will reveal the leaks and the trouble is saved of filling and emptying the boiler each time. When no more bubbles show under, say 25 lbs. air, the hydraulic test can be given.

If everything is found to be tight, the steam dome opening can be cut out by drilling a ring of holes close together, then with a rat tail file cut the fins between holes and the disc will fall out. Trim up the edge with a halfround file.

Drill and tap all other holes and the stuffing box for throttle had better be fitted after the throttle rod and steam pipe is fitted. This and other fittings will be treated next month.

The smoke box can be made from the piece of tube left over from barrel. Firedoor can be fitted and the hasp screwed to backhead by two No. 2-56 brass screws. Dope the threads with Dixons graphite jointing compound.

The Editor, The Modelmaker:
Dear Sir:

As a reader and contributor to The Modelmaker, I have seen many blueprints and drawings of Models, locomotives, etc.

So far as I know the drawings, nine times out of ten were never checked for inaccuracies, and in the one case of where the drawings were checked, they were checked by the person who drew them.

For over six years I have worked in the electrical engineering department of a public utility corporation, and every day of that time, I have handled blueprints and drawings. It has been proven that a person cannot check his own drawings.

Having been shown and consulted many times for my opinion and advice on drawings for Models, I have frequently found that the draftsman had left off important and vital dimensions.

In order to promote accurate drawings for Model Engineers, I offer to check any and all drawings, and give a written report on same for a nominal fee. As I am familiar with control wiring for power stations. I can and am able to check all electrical diagrams as applied to Model Engineering. I, however, will not check any radio or wireless circuits. They are barred.

Here's for more accurate drawings.

Sincerely,
F. D. Grimke, 21 East 87th St., New York, N. Y.

Model Steam Engine Design. A handbook including original tables and calculations for speed, power, proportions of pumps, compound engines, and valve diagrams by R. M. de Vignier. 102 pages, 34 illustrations, price 35 cents.

THE KITCHEN FOUNDRY

By FORRESTER S. WYMAN

(Continued from page 127)

We have made two patterns and provided a core for one of them and now we are ready to start the molding and we must see what we need for this operation.

First we want about 25 lbs. of molding sand, secured at any foundry or in some locations you can go out and dig it. Next we want a small sieve, 6" or so across, with a mesh of 1/16" or a little less to sift the sand onto the patterns. A small quantity of charcoal dust, a good big handful will suffice for a start, this to be used for "parting" or you can secure prepared parting at a foundry supply dealer. A medicine dropper, several very small rat-tail files, or in lieu of these some brass or steel wire about 1/16" in diameter drawn down to a fine point at one end. A piece of cheese cloth to make a dusting bag for the charcoal dust.

Next we must construct a pair of very nice boxes as in Fig. 4, and we must be particular how we make them or we shall have much annoyance. For small work the boxes may be about 5" square and 3" deep and when placed one on top of the other as in sketch, must set evenly on each other and not rock. On each end you must have a lock and this lock must be a tight fit with no play and still withdraw freely without any shaking or banging to separate them. One way to build the lock is to take 3 pieces of wood ½ or ¾" square planed smooth, one piece about 5" long the other two 2¾" long.

Place your two boxes on end, face to face, and have sides in line. Take your square and line up all 3 pieces of wood together. the long one in the middle, bridging the two boxes, the other two on one box.

Now nail the two short strips, keeping the long one in between to separate them the required distance. After the short ones are in place slide the long one back and forth between them and if it does not move easily without play, sandpaper it or take off a thin shaving, until it does, then nail in place on the opposite box. Locks are required on both ends of the boxes.

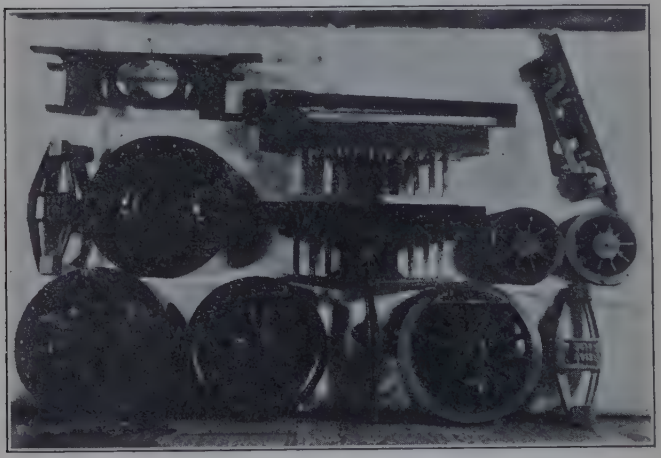
Another way may be used to make a lock. Secure a piece of dowel wood, about ½" diameter, make two cleats about 1" square and 3 inches long. Nail together with small finish nails and square up on 3 sides. Place in vise and bore hole size of dowel wood through both pieces, and keep bit square with wood so hole will be true. Next nail these cleats to boxes and then remove finish nails used when squaring up the wood. Insert dowel wood in the holes and see that it slides freely in one hole. then glue the dowel in the opposite hole. This lock is applied to the boxes in the same place as the cleat lock, Fig. 6.

Fit your boxes together with the glued dowel box on top. Take hold on each end and pull easily straight up and see that the top box leaves the bottom one without dragging it up off the table. If it sticks, sandpaper the dowel till free.

Next we must have two perfectly flat, smooth pieces of board, ⅞" thick and 6" square or larger, according to the size of your boxes. To prevent curling of these boards, two strips ⅞" square may be nailed or screwed to the ends of the boards, and if you chamfer them longway it helps the fingers to get under them when lifting.

squeezed in the hand, do not have it too moist or wet. Put sand in seive and sift or stir through on to the pattern, being careful not to knock box or pattern. Sift in enough sand to fill the box about 1½ inches deep.

Now the sand must be rammed down on the pattern, a piece of broom handle 10 or 12" long makes a good rammer. Tamp the sand evenly all over the sur-



To mold your pattern take one of these flat boards, place on bench and dust off, place the driving wheel pattern we made flat side down in the center of the board, take the box with the two cleats or the hole cleat and place it over the pattern with the cleats next to the board. See that the sides of the box are equal distant from the pattern.

We are now ready for the sand, which should be just moist enough to stick together when

face and don't neglect the corners. Don't tamp too hard or you will break the pattern and don't make the surface of the sand too smooth or the sand will be inclined to "part". Continue to put in more sand until the box is full, ramming as you add the sand, but its not necessary to sift after the first layer which covers the pattern. The box filled and well rammed level off and place the other board on the top.

(To be continued)

PRELIMINARY NOTICE OF THE N. Y. S. M. E. EXHIBITION

The New York Society of Model Engineers are planning their Annual Exhibition which will be held in the Knickerbocker Building, Broadway and 42nd Street, New York City, from December 16 to 21st, 1929, inclusive, from 10 A. M. to 10 P. M.

Arrangements will be made for readers of the Modelmaker, non-members of the society and other clubs and societies to also exhibit models, which are completed or are under construction.

There will also be provided a section in the exhibition for trade firms to exhibit model supplies, tools and apparatus and any models which are built for sale. Terms for space which include an advertisement in the Exhibition Catalog will be arranged at a later date.

Suggestions as to the classes of models on exhibition, competitions, etc. will be received, and given consideration by the exhibition committee.

Particulars with valuations of the models that a reader would be willing to send to the exhibition would be submitted to the exhibition committee for acceptance or rejection. All such models received for exhibition will be fully covered by insurance, and also described in the Exhibition Catalog.

Replies and suggestions about this announcement should be sent to either the Editor of the Modelmaker or else direct to the New York Society of Model Engineers, 29 West 39th St., New York City.

The September Meeting of the N. Y. S. M. E. will be held at 8:00 P. M. on Tuesday Evening, September 24th, 1929.

An interesting program has been arranged. Exhibition details will be gone into, there will be some routine business to transact, and moving pictures of the General Motors Automobile proving grounds will be shown in four reels.

Readers and visitors will be cordially welcomed.

The Fall Power Boat Races have been postponed as the Lake is being reconstructed.

We have just received from Mr. Calvert Holt two samples of permanent way. One a piece of ¼" gauge track and ballast with the new steel rail, the other piece is a section of track 2½" gauge with brass rail. Any of our readers contemplating the development of a model railway system should get in touch with Mr. Holt and get samples of his rail. We understand Mr. Holt is very busy building a number of fine locomotives, and other railroad rolling stock.

Mr. C. A. Johnson, 4009 Berkshire Ave., Sacramento, Calif., writes us he has just finished a 1" scale electric passenger locomotive of the 2—4—4—2 type, 4¾" gauge, 38" overall, and that he is now going to build a passenger coach to match this locomotive, modelled after the equipment used by the S. N. R. Y. on their express trains from Sacramento to San Francisco. We have a good many readers in California interested in model railway work and this is an opportunity for some of them to see a good model.

Any book mentioned in this Magazine can be supplied by Spon & Chamberlain, 120 Liberty Street, New York, N. Y.

Mr. J. W. Dancer, Box 705, Stamford, Texas, one of our oldest subscribers to The Modelmaker writes suggesting that we have more articles on model stationary engines, and that perhaps it would be a good suggestion if we asked our readers to write to us saying what subjects they are most interested in. This would help us very much in planning for future articles. Perhaps some of our readers who see this notice have already built a stationary steam engine, and boiler, and would like to send us in full particulars with drawings of the construction of their model. Including measurements, bore and stroke, materials made from, etc., etc.

Mr. Paul H. Pugsley, 1511 West Mansfield Avenue, Spokane, Wash., has been interested for some time in mechanical work and modelmaking. He would very much like to get in touch with all of our readers in Washington state, and especially those located within a reasonable distance from his home, with a view to calling a meeting with the object of the formation of a Model Engineers Club for the development of this delightful hobby and for the mutual benefit of the members in general. We know we have a good many readers in this far western state, and we hope that they will all get in touch with Mr. Pugsley, and help him along in his good work.

Mr. R. Davies Whittaker, Chief Engineer S.S. Atlantic Sun, dropped in to see us and said he had built a number of ship models, but was now working on a Model of the Coventry B. & O. President Washington Locomotive, and had finished the cylinders. He had purchased the first six sections as he has quite a little leisure time when at sea, and has a well equipped workshop on the ship. He said he considered Mr. Coventry's set of Working Drawings the finest and most complete he had ever seen, and the castings were excellent. He also said he enjoyed reading Mr. Coventry's articles in The Modelmaker.

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Euclid in Colors. The first six books of The Elements of Euclid in which colored diagrams and symbols are used instead of letters for the greater ease of learners. By Oliver Byrne, London, 1847, 268 pages, 7½ in x 9 in., cloth with gilt edges. In splendid condition $15.00. Copies of this work are very scarce. Edward Chamberlain, 215 E. North Ave., Cranford, N. J.

Model Aeroplane Blueprint—A detail drawing of a 3 ft. tractor Monoplane, girder type, wing spread 37 in., propeller 14 in. dia., rubber driven. Size of drawing 15½ x 12 in., price 25 cents. Spon, 120 Liberty St., New York City.

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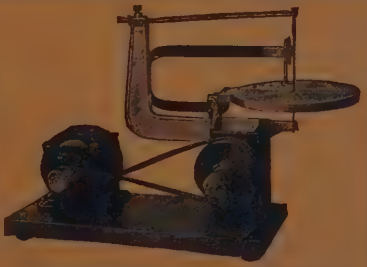

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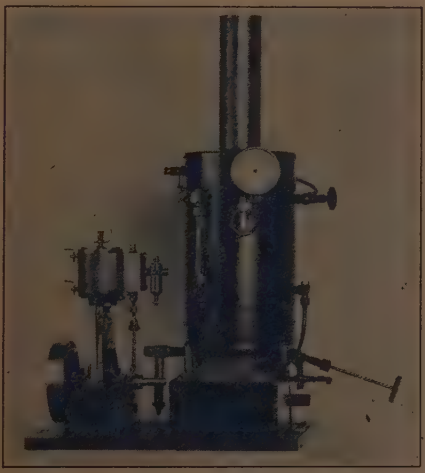

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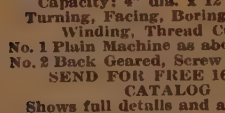

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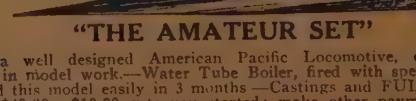

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OUR FOREWORD

Do Exhibitions and Competitions develop the Spirit of Modelmaking? This is a question worth considering.

England leads in the number of Exhibitions of Models, which have been held for many years and in many towns. There can be no question that they have helped the development of Modelmaking to a very large extent.

Exhibitions have enabled the old timer to show the result of his labor and study, have been the means of creating the desire in others to try their hand at the game, and have been an opportunity for the Manufacturer of Models and Supplies to show the public his products.

This happy combination has helped greatly to increase the number of Model enthusiasts and developed what was once considered a hobby, indulged in by a few, into an ever growing industry.

With the Spirit of Modelmaking comes the desire to compare their Models with similar models, and this brings us to Competitions, in which the reproduction in miniature of some prototype its workmanship, finish and operation can be judged.

Model Sailing Yacht Competitions hold the center of the stage. The recent Model Yacht Races at Gosport, Isle of Wight, England, takes first place. This is an International Regatta in which representative Models from England, America, France and Germany participated. Mr. Daniels' "Albion" the British Yacht was the Winner with the American Boat "Bostonia III," designed and built by John Black, Second.

Turning our eyes to the far West we find the Model Yacht Regatta at Los Angeles the greatest event in this line of endeavor with seven hundred entries. This is the Seventh year of the Los Angeles Regatta, and this year the entries were double those of 1928. A great tribute to the men who have worked so hard to interest their young people in this pastime.

Model Power Boat Racing is at present on a much smaller scale, partly because it is an expensive pastime and requires considerable knowledge and mechanical skill.

There are many Modelmakers interested in the construction of locomotives. Perhaps the day is not far distant when we will have races between Model Locomotives.

Model Airplane Races have been very successful this year.

Lastly Models for commercial purposes are entitled to notice. Many examples have been constructed, representing Industrial plants, houses, churcnes, complete power plants, docks, canals, towns, railways ond shipping terminals.

NEW YORK SOCIETY OF MODEL ENGINEERS

A general meeting of the Society was held on Tuesday, September 24th, 1929, at the United Engineering Societies Building at 8:30 P. M.

Mr. Elliott from the chair announced that he was pleased to see so many people attending after the summer vacation.

The Treasurer read the financial report.

It was announced that Mr. Havemeyer's Locomotive Trophy, would be awarded at the Exhibition in December.

An Amendment to the By-laws, tabled from the June Meeting, was read. Proposed by Mr. Cotillieard and Seconded by Mr. Hyer, that the amendment be accepted. Amendment was passed.

It was announced that Mr. R. H. Claudius would head the Locomotive Committee. Mr. F. C. Zimmer would head the Marine Committee and Mr. A. Bauer would head the Aeronautic Committee. All members interested were requested to get in touch with any of the above gentlemen.

A moving picture of the General Motors Proving Grounds was shown.

Messrs. Habl and Brownstein were awarded the Workmanship Medal for September.

It was officially announced that the Annual Exhibition will be held from December 16th to 21st, inclusive at the Knickerbocker Building.

Some awards for the Competitions for the Exhibition were announced.

The Meeting adjourned at 10:30 P. M. with 37 members present and 7 guests and visitors.

Winter Program 1929-1930

Tuesday, October 22nd—Exhibition Details. Talk by Mr. Elliott on his Experiences in the Round Manhattan Race.

Tuesday, November 26 — Track Night.

Monday, December 16th to Saturday, December 21st—Annual Exhibition.

Tuesday, January 21st—Exhibition Reminiscences; Business.

Tuesday, February 25—Track Night.

Tuesday, March 25th—Nomination of Officials for 1930-1931; Moving Pictures.

Tuesday, April 29th—Election of Officials; Chairman's Annual Report; General Business Meeting.

Tuesday, May 27 — Marine Night; Moving Pictures.

Tuesday, June 24th—Marine Night; Business Meeting.

The above dates and program scheduled are subject to change without notice.

All visitors are cordially invited to attend any of the above meetings.

Any enquiries regarding the Society should be addressed to the General Secretary of the New York Society of Model Engineers, 29 West 39th Street, New York City.

FOUR-CYLINDER MARINE TYPE FOUR-CYCLE GASOLINE ENGINE

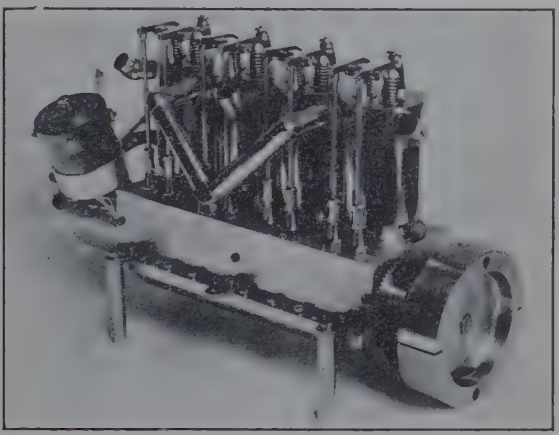
By MR. ADOLPH BOSSHARDT, JR.

The possibilities in Internal Combustion Engines are unlimited, new ideas are continually cropping up leading the designer on to fresh efforts to produce a still finer piece of mechanism giving a greater efficiency at less cost per H. P.

Beside the work I have put into the development of my marine type gasoline Engines, I am very much interested in this type of motive power for model aeroplanes, and I am now working out the details of a 3-cylinder radial air-cooled engine.

I would like to see Modelmakers take a greater interest in the Internal Combustion Engine as I feel sure that as aviation develops and becomes one of the principle methods of transportation, so will its motive power develop and become more universally understood.

The illustration shows one of my latest designs; a 4-cylinder, 4-cycle marine type model power boat engine.



The cylinders are separate, made from mild steel with steel heads having a bore of 1½" and a stroke of 1¼". They are firmly bolted to a base of cast aluminum. The cylinders and heads are water cooled and have overhead valves.

The base measures 7¼" long by 3¾" wide by 2¾" high.

Total length of engine includ-

ing flywheel and special clutch 11⅛".

Total height of engine, 6¾".

Weight of engine, 13 lbs.

Mixing Valve type carburetter.

Splash lubrication.

Ignition supplied by a Remy coil with six flash light dry cells.

Normal Speed, 3,500 R. P. M.

This was the power plant installed in my latest hull, which measured 52" O. A., and made a record speed in the Power Boat Races on the lake in Central Park, New York, last July, of five laps over a circular course attached to a fifty foot cord in one minute, about 17¾ m. p. h. actual.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF THE MODELMAKER, published monthly at New York, N. Y., for October 1, 1929.

State of New York } ss.:
County of New York }

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared W. Edmunds Spon, who, having been duly sworn according to law, deposes and says that he is the Editor and Business Manager of the Modelmaker and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations printed on the reverse side of this form, to wit:

1. That the names and addresses of the publishers, editor, managing editor, and business manager are:

Publishers, Spon & Chamberlain, 120 Liberty St., New York, N. Y. Editor. W. Edmunds Spon, 120 Liberty St., New York, N. Y. Managing Editor, none; Business Manager, W. Edmunds Spon, 120 Liberty Street, New York, N. Y.

2. The owners are Spon & Chamberlain, 120 Liberty St., New York, W. Edmunds Spon, 120 Liberty St., New York; Wm. Chamberlain, 120 Liberty St., New York.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner and this affiant has no reason to believe that any other person, association, or corporation, has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

W. EDMUNDS SPON,
Editor and Business Manager.

Sworn to and subscribed before me the seventeenth day of September, 1929.

CHARLOTTE S. GALE,
Notary Public, Kings County, New York, (My Commission expires March 31, 1930). (Seal) Kings Co. Clerks No. 252, Reg. No. 390. New York Co. Clerks No. 824, Reg. No. 0-554.

Mr. Baine Isaacson, 126 East Fern Ave., Redlands, Calif., writes us that he has a nice lathe and workshop, which he fitted up this summer. He is working on one of Birch's Model Locomotives for a ½" scale model railway system. He would like to get in touch with any of our readers in his district who are interested in model railway work.

When writing to advertisers, please mention The Modelmaker.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR H. J. COVENTRY, M.E.

(Continued from page 174)

Boiler Fittings and Lagging—We now come to what should prove an interesting and easy job. Make all the parts for the boiler fittings, then make one job of the sub-assemblies finally putting each unit in its proper place.

Throttle Valve Unit — (1) Take the Throttle Box casting part No. 3B8, hold in chuck by the lug provided for this purpose, face off top, turn flange, also the collar under the flange.

(2) Take Dome Base part No. 1B8, hold in chuck by the flange or better still make a split ring a little large in diameter than the flange to slip over the body part and grip in chuck by this. Face off outer edge, bore out part ⅞" then 1" to ½" deep. Try the Throttle Box in, it should go in easily. When right chase the threaded portion. Take out of chuck and lay aside.

(3) Turn up the cap, part No. 2B8, chase thread and fit to part No.1B8 dome base. Be sure the two parts screw together correctly before removing the cap from chuck. If the lathe has no screw cutting arrangement, this job had better be done by someone who has.

(4) Now make a screw plug bolt like sketch of any odd piece of brass or steel, Fig. 53, to fit on the Dome Base 1B8. Screw the base on, then slip the bolt in slot or hole of angle plate and bolt the latter to face plate. Locate so that top edge "a" is 2¼" from lathe center. Now turn out the curved seat till the dome base is ½" high at center. Take off and lay aside with the throttle box and cap.

(5) Turn up the collar 4B8, also the throttle pin, and lathe work is finished.

(6) Mark out all holes in throttle box, drill and tap according to drawing, then file or mill the slide valve way.

(7) Make the valve part 6B8, file the flats on throttle pin 5B8 to form the eye, and drill same.

(8) Grind the valve and throttle box together with a little pumice and water.

(9) Drill the No. 39 holes in Dome Base.

The throttle pull rod, steam pipe, throttle lever and fulcrum can be made, also the stuffing box No. 474 gland No. 574 and steam turret No. 274. The outer steam dome cover which will be supplied in aluminum needs only filing up smooth and to fit top of lagging.

Superheater—The header is partly finished as we used it as a covering for the steampipe hole. Finish out the drilling and plug the holes as indicated either with a 5/16"-32 screw plug or a plain plug driven in and brazed. It is a good practice to countersink the holes say 1/32" wherever plugs or pipes are to be brazed. To make the "elements" a simple bending device is needed, made like sketch Fig. 54. The bottom roller can be made of hard wood, cast iron or steel in which the handle is fulcrumed, carrying a small steel roller. Larger radii

may be bent on the pipe than the bottom roller provided merely by pulling the lever over a little, then pull the pipe back a little, bend again and so on. Smallest radius capable would be that of bottom roller when the pipe is pushed through between the rollers and the handle brought right around. The bottom roller can be held in the vise during a bending operation. Take a 11½" length of ¼" copper tubing and bend one end to 1" radius about half inch of bend is all that is needed then file the end parallel with the straight portion. This will produce the "spear" end. Do four tubes the same. Then change the roller of bender to one of ¾" radius, and bend up the other ends of tubes, note that the bends on one pair start at 8¾" from "spear" point and the other 9¼". Be careful to mate the tubes at spear ends, then no mistake will be made in bending the header ends up or down. The steam pipe outlets can be bent and screwed and then having all joints nicely cleaned with emery cloth, we are ready for brazing or silver soldering.

Bind the elements together with iron wire in their correct position, have a pan of coke or charcoal. Cut a narrow strip of silver solder and bend it around the joint. Cover it with a paste of borax and water or one of the brazing compounds lay in the charcoal and put the flame on serving in more borax or solder if required. The solder will melt at a dull red heat and little doubt will be had when the joint is "made" as the silver solder will show up brightly and will quickly flow around if you take care to prevent oxidization by keeping the joint covered with the borax. An iron wire may be used to coax the flux and solder around.

Safety Valve is quite a simple lathe job. Chuck a piece of ½" hexagon brass, face off end, turn back for ¼" to ⅜" diameter, screw ⅜"-32 center and drill down for about 1" and cut off with the "parting" tool exactly 29/32", now drill and tap ⅜"-32 the piece of stuff left in the chuck. Screw the valve body you have just made in and open out the 3/16" hole to ⅜" for a depth of 9/16". This should be done with a pin drill with a 3/16" pilot, as it is essential that the valve seat has a good square edge. The outside of body is to be threaded ½"-27. The Cap may be either knurled on its outer face or better still slotted with a ward file in about six equal spaces. Four 3/32" or No. 40 holes drilled in top provides for escape of steam. A ¼" bronze or stainless steel ball, stem and spring completes the job. Screwing down the top cap increases the blowing off pressure.

Water Gauge—Castings are provided as sketch Fig. 55 which gives top and bottom heads of gauge. First, cut in two, then put in chuck by lug A, and turn, drill and screw the shank that goes into the boiler. Do not drill too far down. 11/16" is enough, measured from finished face of screwed portion. Take out of chuck and put the lug at right angles in, turn face screw and drill 5/32". Now file up the two side faces clean, then cut chucking lugs off. Chuck 2 pieces of round stuff, drill and tap one 3/16"-40 and the other ¼"-40. Screw the fitting in and face off top

and front side of square portion. Tap the 5/32" hole to 3/16"-40.

The bottom "stand" or head can be made similarly with the exceptions that are obvious on drawing. The 3/32" drilled passage is opened to ⅛" at front and then tapped 5/32" for screw needle valve. The tapping should go in ⅜".

The nuts need no comment except that the inside should be square bottomed with flat cutter or end mill, or a pin drill, with 5/32" pilot. Make seven nuts.

Check Valve.—Two check valves are required which should be made according to Style B No. 355B as shown on drawing.

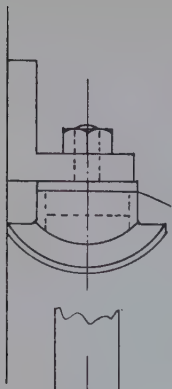
Blow Off Valve and Blower Valve are self explanatory.

The injector is exactly as made by the well known London model maker, L. Lawrence (L. B. S. C.) and a full description of making is given by that gentleman in Model Engineer for Nov. 13 and 20, 1924. The drawings accompanying the castings are made exactly to the above mentioned notes by L. B. S. C., and no difficulty should be encountered if care is taken to work exactly to the dimensions. Details of the special reamers required for the steam delivery and combining cones are also given on drawing.

The body casting should be chucked by one end, drilled and reamed right through, faced off and screw 5/16"-32 on outside. Then tap a piece of round stuff 5/16"-32, hold in chuck, screw body in and turn and screw other end of body. To machine the overflow valve chamber and water connection, drill a piece of round brass ½" with center 5/32" off eccentrically, split through as sketch Fig. 56, slip over the ½" diameter portion of body and grip in chuck. The water suction end can now be turned screwed 5/16"-32 faced off and drilled ⅛". Make a similar eccentric collet but tapped 5/16"-32, screw on to body so that center line of casting is on line of eccentric centers, Fig. 56 and grip tight in chuck. Drill, tap, square out bottom and face off top. The combining cone part No. 254 is to be made a tight fit in body and carefully driven or better still pressed in. After the cone is pressed in, drop a ¼" steel ball in overflow chamber, give it a light tap with a hammer, through a piece of brass rod and if the seat is first clean and sharp square edged, the ball will find a perfect seat. Use either a bronze or stainless steel ball. If the former, you need to treat the seat as above with an ordinary steel ball; if the latter, the ball itself may be tapped to form the seat, and then used as the valve. Drill and tap the overflow outlet ¼"-40, make three union nuts and sleeves, also the steam and delivery cone which should slide into body easily.

Three screw down stop valves will be needed, one No. 2 for injector steam and one each No. 1 for blower and brake. The machining operations are similar to injector parts.

Smoke Box Front. — This should be held in the chuck by the flange and the screwed portion turned and threaded, facing the flange at same time. If your chuck will not take the flange, clip to the face plate with curved door portion outward and then turn the "door" 1¾" dia. 3/32" back. Now hold in the chuck by this step and



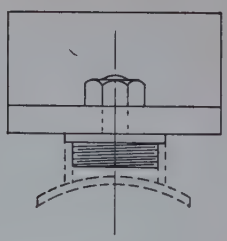


Fig 53

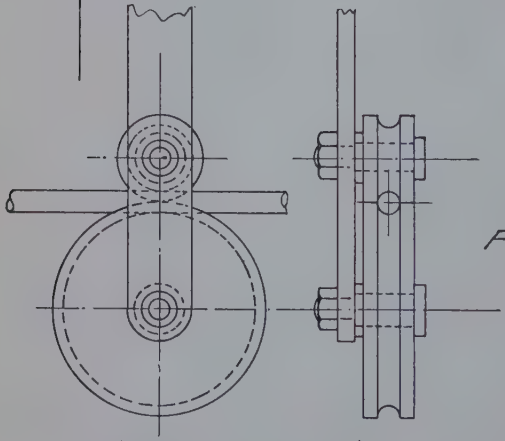


Fig 54

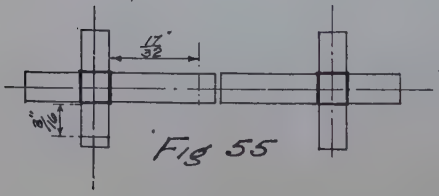


Fig 55

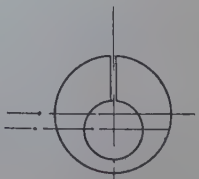


Fig 56

turn threaded part. Next, take the ring chuck or mount it on faceplate bore and cut thread to fit the front previously made. Screw the two parts together, grip the front by the step in chuck as before and turn the ring to a nice fit inside smoke box. This being done, take out of chuck and reverse, holding in chuck by the ring. Do not grip too tightly or the flange and ring may be distorted. Drill No. 49 hole in front and bring up the tailstock. This will prevent the job from coming out of the chuck, if it is not held sufficiently tight. Now finish the front right out and round the edge of flange. There is ample allowance on casting to permit of turning the front all over. Before removing from the chuck, screw the front out. If it will not come by hand grip, take out of chuck, and drill two holes No. 44 diametrically opposite, on edge of ring. Slip two pieces of No. 44 drill rod in, lay a piece of steel across them as a lever. With the step portion held in chuck, a pressure on the lever will start the ring.

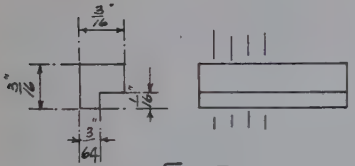


Fig 57

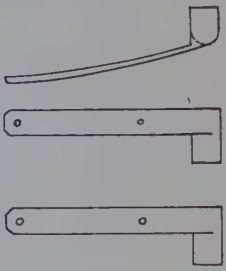


Fig 58

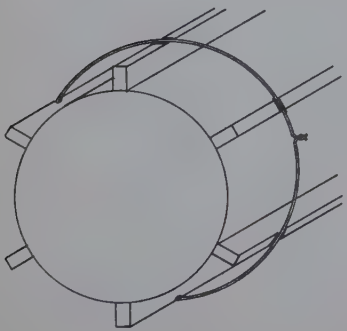


Fig 59

Smoke Box Door Dogs — It

will have been noted that the smoke box door is solid with the front, the reason should be obvious as the standard design of American door is too small when reduced to scale to permit of access to inside of smoke box. Hence the whole front is screwed into the ring, which is rivetted or screwed to smoke-box in a manner to be described later. The door dogs or clamps are dummy and when neatly made and applied give a very pleasing and realistic appearance. Proceed as follows:

Take a piece of 3/16" square brass about 2½" long and mill or file a step 1/16" deep. See sketch Fig. 57. Now cut off slices of this bar, ⅛" wide with a jewellers hacksaw by preference.

If you have not succeeded in cutting them off of even width, tin one side with soft solder also any piece of flat brass plate, heat up the plate, lay the dogs on cool off and then a few strokes of a fine file across the whole set will soon make them all of same thickness. Heat the plate again and wipe off any adhering solder from the dogs. Next make two dummy hinges and butts like sketch Fig. 58. Now all is ready for application. First tin the under sides of all dogs and also the hinge pieces using a minimum amount of solder. The smoke box front must also be tinned all around the door. Wipe off superfluous solder with a clean cotton rag. Now, support the smoke box front level and steady high enough to get a bunsen burner under, then brush over with soldering fluid and lay all the dogs and hinges on, distribute them evenly (a pair of tweezers is almost a necessity in model making.) Everything being located nicely, light the burner and warm up the whole set till the solder melts, cool off and it will be found that every dog is tight and no solder showing as fillets or nodules. All that is necessary now is to drill each dog and tap through to smokebox for No. 0-80 hexagon screw. If neatly done, the result will meet the approval of the most critical. Wash off the soldering fluid in warm water and then screw the smoke box ring on hand tight. Now, locate the unit in the smoke box shell placing the hinges horizontal. Mark the smoke box also the flange of front, then pull out and transfer the mark to the ring. Screw the ring off and put in S. B. shell mark to mark, drill through from shell spot No. 44 follow No. 49 and tap 2/56 for round head screws. Shorten the screws as found necessary.

The Smoke Stack is first held in the chuck bored through 23/32" then pressed on a mandrel and the outside turned and threaded as indicated. The Stack Base No. 570 can be bored ⅞" and the outside cleaned up with a file. The same remarks apply to the curved ring or washer No. 271.

The Petticoat or draft pipe must be first bored and threaded to fit smoke stack then it may be screwed on a short stub held in chuck, and the bell mouth machined out.

All the boiler parts should now be assembled and fittings mounted. To mount the fittings such as gauge glass screw the collars on tight and make a mark on collar and fitting, slip the collars with the top and bottom heads into the boiler back head having a piece of 5/32"

drill rod or pin connecting the two heads. Mark the collars and back head, screw the fittings off the collars and sweat them into backhead mark to mark.

The glass of water gauge can be made tight with a small coil of worsted treated with boiled oil and graphite or a small washer of rubber may be cut to fit glass and stuffing box. This can be done with a sharpened piece of tube, or a specifically turned and drilled piece of drill rod.

Lagging—The front portion of boiler should be covered with a layer of asbestos cloth 1/16" thick and No. 26 gauge brass wrapped around. Now, cut out a piece of No. 26 brass according to the template Drg. No. 93, when this is rolled around it will give the conical portion. Wrap round the boiler with joint on underside and tack solder in two or three places to the front sheet. The straps should be made of strips of the brass and a ⅛" screw and nut fitted at ends with clearance between so they may be drawn up tight.

See that the conical section is concentric to boiler barrel and then ram in abestos wool or magnesia. The next section of barrel is 4⅛" dia. giving a 5/16" space all round to be filled with asbestos. The best way to do this is to cut some slips of wood 5/16" wide and lay them around binding on with wire as sketch Fig. 59. Now fill in the spaces with asbestos wool mixed to a putty with water and smooth off. Allow it to dry and apply the jacket. An alternative is to wrap the barrel in layers of asbestos cloth to 5/16" thickness and apply jacket as before.

(Next month, we will take Cab and Running Boards.)

A MODEL VERTICAL STEAM BOILER

By Mr. Frank Birch

I have had many inquiries from time to time for a model steam boiler suitable to run a small stationary steam engine; so have recently placed upon the market this Vertical fire tube boiler, which can be fired either with ordinary house gas or vaporized gasoline.

The illustration shows this boiler connected to one of my single cylinder double acting high speed steam engines of 1½" bore with 1¼" stroke.

The boiler is 10" high by 6", of seamless steel tube 6" O. D. 3/32" gauge, the ends are plates of 3/32" copper flanged over to fit snug into the tube and riveted, and contains 26 tubes of 1/32" gauge copper. In the head of the boiler is a superheater of copper tubing.

Steam can be raised in four minutes and I have carried as much as 100 lb. pressure, during the continuous test run of 6 hours, which I made, using a vaporizing gasoline burner with an air pressure of 20 lbs.

The bolier is supplied with water from a small hand pump, but a power pump could be attached to the engine or an injector used. [In a later issue of the Modelmaker we hope to give a detailed description of the construction and a list of material.—Ed.]

Change of Address. Please notify Us when you move. A few lines on a postcard giving your old and new addresses will greatly aid us and save us unnecessary corespondence in keeping our lists up to date.

THE KITCHEN FOUNDRY

By MR. FORRESTER S. WYMAN

(Continued from page 176)

Now you have a board on top and bottom and the next move is to reverse the position of the box without having either board losing contact with the box. To do this, place palms of the hands on edge of top board, your fingers will rest on the bottom board, grasp the two boards firmly in the span of your hands, lift up and turn, so that the top board rests on the bench and the bottom one comes on top. A little practice and its easily done without moving the boards very much.

Pull off the now top board, and your pattern should rest in the sand, with the sand filling all the spaces between the spokes and also all around the outside diameter. If the sand does not completely fill all the spaces you will have to repeat the process until the desired result is obtained.

Get out your charcoal dust and put some in a piece of cheese cloth or other loosely woven cloth. Make a bag out of the cloth or take a square piece and bring up the 4 corners so you can sift the dust through. Cover the surface of the sand with the dust just enough to cover the surface, no more. Take the medicine dropper and use it as a bellows to blow all the dust off of the pattern. This layer of dust is used to prevent the sand in this box from sticking to the sand which you will soon ram down on top of it.

The other box is now to be used, slide the cleats or dowels into place and proceed to fill this box as you did the other and you need not sift after the first layer. Be careful when you tamp this first layer on top of the pattern and do not ram too hard, the idea being to fill this box with sand firmly enough so that it will hold when lifted up and also make a firm contact with the sand in the lower box.

The top box filled, place the other board on top, take your ramming stick and rap this top box easily all the way around, just above the joint with the bottom box, this rapping is to cause the sand to "part" on the surface spread with the charcoal dust, thus enabling you to lift this top box without any of the sand in the lower box pulling up.

Grasp the top board as before and lift slowly and easily and when clear of the locks reverse as before and set box on bench keeping the board in place.

If we have had good luck the bottom box looks just as before, the sand smooth and the pattern in place. The surface of sand in the top box where it was in contact with sand in the lower box will show a smooth impression of the back of our wheel and none of this sand will have stuck to the bottom box.

Next comes the chance to show your skill. Take the medicine dropper, fill with water, and starting near the hub, drop a drop of water on the sand and proceed toward the rim following the edge of this little island of sand between the spokes. As you drop the water you will ob-

serve the sand crawls away from the edge of the pattern. Don't flood with water, just barely enough to make the sand "crawl". Do this between all the spokes and around the outside edge of the wheel also.

Take a lead pencil or something similar and tap the pattern, tap the hub first and then on each quarter of the rim and then go very gently all around the rim. This tapping is to free the pattern in the sand and prepare it for removal. If you are too strong with the tapping you will rock the pattern and the result will be an out of true wheel casting.

The rat tail file or sharp wire comes next and you press this into the center of the hub in a small hole provided previously. Rest your hand on the edge of the box, with thumb and finger holding the file, lift straight up just as easily as you can and the pattern will leave the sand. It it shows signs of pulling the sand with it, let it back into place and tap again or use a little more water where the "stick" is indicated and you will probably get it clear and a good mold left. With a piece of tin about 3" long and ½" wide, bent V shape lengthwise, make a gate from the edge of the rim impression to a point about 1 inch away. This gate is simply a little V shaped ditch in the sand for the metal to flow to the pattern mold, and shall be just as deep as the bottom of the mold and smoothed to prevent loose sand from being carried into the mold.

In the top box we must provide a hole in the sand, from a point directly over this gate, to the top. A piece of old hollow curtain rod ¼ or ⅜" diameter makes a good tool for this job. Spot the location of the gate and push the curtain rod down through the sand to the board and pull out, the sand will be in the tube and a nice clean hole is left. Turn this top box over on its long side, and with a

spoon scoop out a cup shaped hole around the end of the hole running through. This will make a little pond into which to pour your metal. Pick up this box, without the board and turn slowly over into position so you can lower it into place over the lower box. It is good practice to turn this box, to one side of the lower box as loose sand sometimes drops and if it drops into the mold, it causes trouble.

In some kinds of work such as this wheel and long narrow patterns, it is of advantage to use two gates and two holes as this enables the metal to flow into the pattern from two sides and fill the mold. To do this proceed as in the case of one gate except that the pouring hole should slant and meet at the surface, like the two sides of the letter F. 5. One pond will serve the two holes, but you will have to pour a little faster.

Before pouring the metal for the wheel, we will mold the stack pattern with its core. Take one half of the pattern, without the pins, and place it flat side down on the board as we did the wheel. Proceed as before to ram the sand and fill the box, reverse and remove board and we find the pattern flatside up as before. Blow any sand off surface of pattern and then take the other half with the pins in it and fit into the holes. Sift the charcoal dust over the surface of the sand but put none on the pattern. Place top box in position, fill and ram with sand as before, then pull up and reverse.

Now we will find the pattern as we lift it, and this time we find an impression in the sand of top box, for the top part of the pattern has remained pinned to the lower. Remove the top part of the pattern which should lift easily, but should it not lift, drop the water around the pattern as before tap the pattern and lift out the whole pattern. Now you have the core to drop into place in the recess at each end of the mold, using a bit of string or a long slip of paper for a sling. This time make your gate in the top box for we want the metal to flow into the mold as high as possible.

As we have two molds ready we will heat the metal and get ready to pour. A small sheet iron spider or frying pan about 6" across will do the trick and we place the metal in this pan and sit it on an ordinary gas burner. If you have quite a chunk of metal and have not melted any before it will take quite a few minutes to get it started, but keep the heat on and push down on the metal as it melts so as to get all the surface you can in the pan. Once the metal starts to melt the action is quite rapid and soon your pan is full of hot silvery metal. Heat until it shows a faint pink when shaded from the light. The scum on top does no harm, and just before pouring take a pinch of Sal Ammoniac and sprinkle over the top, stir slowly a minute and then you can push all the scum away from the spout.

Take the pan quickly to the mold and pour evenly into the pond and keep a steady stream flowing, until the hole and pond are full. Bubbles will rise but keep pouring as long as you can without running the metal over the side.

About 3 minutes after you have finished pouring you can lift up the top box, and the casting will come out with it, held by the metal in the pouring holes. Set this box on the

bench and push the sand out of it and then with a pair of pliers you can pick up the casting and set one side to cool. When cool saw off the gates as closely to the casting as you can, file and your casting is ready to finish as you desire.

This metal can be heated in a coal fire but a deeper pot is needed to secure the proper heat. Brass can also be used with a coal fire but a considerably longer heat would be required.

All of the proceedings outlined are suitable for brass or even iron, but a good deal more heat is needed and so the white metal is more suitable for the small work.

EXHIBITION PROGRAM NEW YORK SOCIETY OF MODEL ENGINEERS

The Exhibition will be held from Monday, December 16th, to Saturday, December 21st, 1929.

The Exhibition will be open from 10.00 A. M. to 10.00 P. M. on the above dates. There will be no admission charge, and only a nominal sum for the Exhibition Catalogs.

The Exhibition will be quite different from the first one, inasmuch as there will be trade stands, exhibits made by non-members of the Society and also Exhibits loaned to the Society by other Model Making Organizations.

The following Schedule of Events for the Exhibition is as follows:

10.00 A. M.—Exhibition is opened.

2.00 P. M.—Moving pictures of Models in action.

4.00 P. M.—Demonstration of Locomotives on the Society's Portable Track.

8.00 P. M.—Moving Pictures.

9.00 P. M.—Track Demonstration.

10.00 P. M.—Exhibiton closes.

It is understood that if there be three or more entries to the various Competitions, Prizes will be awarded on the last evening. There is also a prize given to any visitor who will submit to the Society on or before January 15, 1930 the best description and opinion of the Exhibition in not more than 1,000 words. Members of the Society and all Exhibitors are not permitted to enter this contest.

The Schedule of Events may be altered so as to include new features if necessary. At present there are two alterations to the above. At 8.00 P. M. Monday December 16th, the Chairman of the Society will make an address. On Saturday, December 21st at 9.00 P. M. the Chairman of the Society will present the Awards and prizes.

The Exhibition will be held in the Knickerbocker Building, Broadway and 42nd Street, New York City.

Mr. L. J. M. DeJong, 1604 N. 19th St., Richmond, Va., writes us that he is now at work on a Model of Pennsylvania K 4 Pacific Locomotive, ½" gauge. He would like to get in touch with anyone in his district interested in model work, with a view to an occasional meeting.

Mr. Frank Birch informs us that his new list of materials is now ready, and he will be very pleased to hear from any of our readers.

We have just received an illustrated descriptive circular from the Goodell-Pratt Company, describing their new One Quarter Inch Electric Drill, embodying every desirable feature in a general purpose drill, straight line designed, plenty of power, extreme light weight, excellent balance, instant switch control, thorough ventilation, and positive lubrication, built and powered for dependable drilling in metal and woods, buffing, polishing, grinding, wire brushing, sanding, and hundreds of other jobs. The total weight is 4 lbs. The workmanship is of the best, and this is a tool that should certainly appeal to Modelmakers, especially those who aim to have as complete an equipment in their workshop, as can be obtained. We would suggest they send to the makers for full particulars.

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THE MODELMAKER

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OUR FOREWORD

In all new industries, pioneer developers have had their products copied, and inferior copies placed on the market, in competition with the genuine article.

This has been done in several instances in the Model Field, and in every case the imitation was inferior to the original, but it had a moderate sale, because it was offered at a lower price than the genuine article.

An instance of this kind has just come to our attention. A certain man selected a prototype from which to make a Model. He devoted his knowledge, ability and weeks of his time to making the necessary calculations and the work to complete a set of scale drawings to detail. The patterns were made, castings procured from a good foundry, and the sets of materials and blueprints for this Model were placed on the market for sale, where it met with a fair success.

Another man, not having the pioneer's experience or knowledge, purchased a set of the drawings and materials and built a Model from them, which he sold to his customer as his work. He then purchased another complete set of drawings, and selecting the principal drawings, made tracings of them, from which blueprints were made, and some sets sold. He does not put the type of the Model or his name and address on the blueprints, neither does he supply the castings made by the designer.

The designer was willing to supply sets of drawings and castings at a fair price, so that the other man could build them, and sell them at his price to his own customers.

It is to be hoped there will not be many cases like this one, as it surely will be discouraging to other Model designers who contemplate putting new Models on the market for sale. The Modelmaking business is a new industry in this country, and those putting their skill, time and money into the development of it deserve the support of all fair minded Mcdelmakers.

Misrepresentation comes within the province of the "Dishonest Trading Act," but there is a higher court than the ordinary Law Courts, The Court of Public Opinion, where we are quite sure that such acts of Piracy are not sanctioned.

A MODEL OF THE SANTA MARIA

By Mr. J. P. Brooman

Being a constant reader of The Modelmaker for the last three years I thought possibly the following short description of a Model of the Santa Maria I built might possibly be of some interest to your readers. I enclose a photograph of it.

The model was built under rather exceptional circumstances I being stationed at the same time at Belle Isle, just north of Newfoundland, off the coast of Labrador. I went there in November and the first mail was not received until the following June. Needless to say when it came to the building of this model I had forgotten a good many essential things one of which was a lack of small nails of any description.

The hull from the keel to the waterline was carved and dug out of a solid block of wood. Ribs were then mortised into this block and from the waterline to the rails were planked; all planking being fastened to ribs, stem and sternpost by wooden pegs. It was a slow job but when finished was found to be good and strong as well as making a neat job. Deck was then put on, and winch, small boat, companionways, and all deck fittings added, all made of wood. Anchors were of wood and brass, pin rails of wood with small brass wire filed to represent belaying pins. Rudder was fitted with whipstock operated from lower aftercastle deck. Hawsepipes were made from shoe eyelets of different sizes made slightly oval when necessary.

The hull with its fittings took up most of my spare time the first year and after I had changed to my present station I started on the rigging. The plans I followed did not show much detail so several books with article concerning rigging of old time vessels were studied and parts to suit the period were picked out. Blocks and deadeyes are of hard wood sawn, carved and filed out. Rigging of various kinds of fishing line. Sails are of silk with boltropes of heavy linen thread, crosses on them being worked in silk. With a small amount of lead on her keel she sailed quite well considering her lines. It took me about two years of spare time to complete this model. It is the second serious attempt I have made at modelling old time ships, the first being a model of the Cutty Sark. I am at present building a model yacht on the rib and plank system. Wishing your magazine every success.

One of our staunchest supporters writes as follows: "In regard to articles in The Modelmaker, I would like to see some more like Mr. Coventry's articles on the B. & O. President Washington. Something of a real educational value. I suggest the following as subjects that would appeal to many of our readers. Real meaty articles viz. "Files, their care and use." "Marking out Methods and Measuring Instruments." "Planning the Job for Tooling." "The Grinding of Lathe Tools." "Making Counterbores, Pin Drills and Small Cutters." Perhaps some of the readers of The Modelmaker would like to send us in articles covering some of these subjects.

Have your back numbers of The Modelmaker bound up.

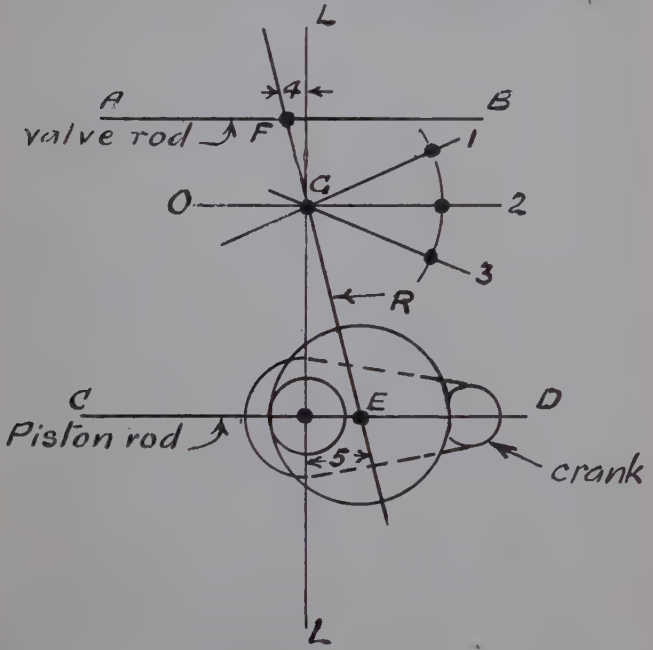
BREMME'S VALVE GEAR

By MR. ALFRED S. THOMAS

New Zealand

Walshaert and Baker valve gears are deservedly popular and now used very considerably in connection with model locomotives. The fact remains, however, that the making of these gears involves a fair amount of work and care. This is particularly the case with the making and centering of the Walshaert expansion link.

In order to avoid this I commend to readers the adoption of a valve gear which is unfortunately but little known, and as the sketch will show, is made of few parts which present no difficulty in construction and entirely eliminates the expansion link which is always the ama-



teur's stumbling block. Lap and lead is effectively provided for and the gear gives a beautiful steam distribution.

It is known as Bremme's and has been used with success on marine engines and to a certain extent on Continental locomotives.

The sketch shows the lay out and I advise readers to construct a model of the gear on a piece of board and observe its fine movements. Simplicity is its charm and the adoption of it for model locomotives is fully justified.

Draw two lines AB and CD parallel to each other and representing the valve rod and piston rod. Draw another line LL at right angles to these. Set off along AB the dimension 4 which equals lap plus lead and set off along CD the dimension 5 equal to half the travel of the valve. Now run a line through EF and where it bisects at G draw the line at 02 which represents the center line of the vibrating link. R is the eccentric rod. Positions 1, 2 and 3 represent forward, mid-gear and back gear and the reversing lever may be attached to point 2. The movement for reversing from 1 to 3 should not on any account be more than 50°.

It will be observed that 5 is equal to the radius of the eccentric and that the eccentric is set along the same center line as the crank arm.

We have been advised that the new Secretary of the Boston Association of Model Engineers is Mr. P. S. Ross, 20 Auburn Ave., Somerville, Mass. This gentleman would be very pleased to give full particulars of this very active organization.

Mr. C. Baldwin White, 6 East Witherspoon, Princeton College, Princeton, N. J., came in to see us recently and showed us a Model of a Flat Bottom Row Boat which he had built. It was planked and ribbed in oak, 11¾" long by 4¼" beam, completely fitted with seats, thawl pins and two pairs of oars, also a Model of a small Dinghy carved from a solid piece of pine and fitted with seats, 5¼" long x 1¾" beam. Both of them are extremely good examples of handicraft work. Perhaps some of our readers will remember this gentleman's article some time ago in The Modelmaker on the construction of an Electric Railway Signal.

The Proprietors of "The Model Yacht" advise us that they are discontinuing the publication of this Magazine with the September issue, but that they have made arrangements with Mr. A. R. Brown, Melrose Highlands, Mass. to combine it with his publication "Model Yachting," and that this gentleman will fill all unexpired Subscriptions with the new combination. Mr. Brown is well known as a model yacht designer and builder, and we hope that all who are interested in this sport will help him to make "Model Yachting" a success.

Mr. H. J. Coventry's series of articles on the construction of his Model B. & O. President Washington, commenced in the October, 1928, issue of The Modelmaker. All of these numbers to date are still in print. These are the most complete set of articles every published on the construction of an up-to-date American Model locomotive to ½" scale, 2½" gauge.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR H. J. COVENTRY, M.E.

(Continued from page 193)

Cab Running Boards and External Details—Taking the Cab first, it will be seen by Dr. 75 that one side and half the front is all one sheet of 20G brass. The 7/16" gap left at top is provided to clear the steam turret. The connection of cab to boiler and frame is effected by means of an angle fitted to top of boiler and angles inside sides of cab screwed to deck plate. This in turn is attached to the rear apron plate, thus the boiler is free to expand due to the flexibility of furnace bearer plate and cab apron plate. The smokebox end being securely screwed to cylinder saddle.

The roof of cab is made to slide right off for convenience in driving and the roof ventilator slides back for access to throttle even if the roof is on.

It is a good plan to set out the side sheet on stiff paper or thin card first, obtaining a correct template to cut the sheet brass to. It is cheaper and easier to alter a paper template than to use the brass right away. The window sashes are cast, thus saving cutting out but they should be filed up neatly and frame work made even. The runners are sweated to inside of cab and the roof clip attached to top sash runner. This may be done with three 0-80 screws tapped into runner or it may be sweated. The windows in front and openings in side are best cut out by drilling a row of holes around outline and cutting the fins with a small sharp chisel. Another method is to drill a hole in corner, clamp a piece of wood, say ⅛" thick on under side and then saw out with a fret saw.

The roof may be bent over a block of wood cut to shape. The beading is easily put on if following note is observed. Take a length of 1/16" half round brass wire and tin it on the flat side by rubbing the soldering iron along. Try to prevent the solder from running around the curved side. Tin about ⅛" of the edge of roof sheet and then clip the wire with a clamp so that the wire is just over the edge of sheet. Now take a hot soldering iron with a minimum amount of solder and apply to the edge. If done carefully, no superfluous solder will show on inside edge of wire to spoil the appearance of the beading. Move the clamp back a distance and repeat the process. It is best to use two clamps and sweat between them, leave the last one on and put the first one in advance, then leave this one on and bring the other one in advance and so on. When you reach the corner, bend the wire round carefully with round nose pliers.

Deck Plate is a very simple job, all that is necessary is to follow the drawing. From the scrap left after cutting out, the boiler waist sheet may be made and attached to part No. 290 which it will be remembered was left unfinished. The Reverse gear reach rod and reverse

rod also bracket and pawl can be made up, and located on deck plate. Then turn up the reverse cylinder (dummy) and drill 5/16" as shown on drawing. Mill or file the sides away thus forming the crosshead guide. The cylinder end is drilled ⅛" or No. 30 to allow reach rod to pass through. Cut out the reverse cylinder bracket from a scrap of 1/16" brass left from deck plate shape and fit to boiler barrel jacket, then screw to cylinder. The bracket will be soldered to jacket later.

Similar remarks apply to air compressor. The headlight turbo generator is turned from ⅝" brass bar, and then soldered to a bracket made of No. 20 G brass. This in turn is sweated to jacket at a point 1½" up from center line of boiler and 1⅜" out, on the LH side.

The headlight is turned from a casting and the inside bored out to a parabola. The bezel should be bored a "push" fit, this would be about one quarter thousandth less in diameter than the headlight. The curved base may be filed up to fit and soldered to headlight and the bracket bent up of 1/16" brass for attachment to smoke box front.

Bell Stand—This is a casting that needs filing up clean and base turned by holding in the chuck with the lug cast on. The trunnion bell carrier must be filed a fit between the horns of the bracket then sweat it in place and drill No. 52 right through, unsweat and file off the solder, then slip pieces of No. 52 drill rod in and secure by a little touch of solder on end on inside of bell trunnion. The trunnion will be found to swing nicely. The little lever on outside can be made and applied the same way. Turn the bell up from a piece of ¾" brass being careful to get the outside profile correct. A poorly shaped bell spoils the appearance of a model locomotive.

Whistle may be built up as indicated sweated together and a light cut taken over in lathe and polished.

Couplings are made in two parts sweated together. First clean out the knuckle pocket, shape up the knuckle, drill and fit all together and when satisfactory sweat together. It is best to sweat the shank only then there is no fear of soldering everything up solid.

The pilot is built up of strips of 20G brass ⅛" wide soldered to a ⅛" x 1/16" frame work. An aluminum former is supplied upon which to make up the pilot. The solder will not stick to the aluminum and being a good conductor of heat, the joints will be quickly cooled as soon as made, thus preventing previously made joints from fusing.

Bend a piece of ⅛" x 1/16" around the bottom of former and another across the top. Let the ends stand over. Cut up fifteen strips of 20G x ⅛" and lay them one at a time on the top bar and solder in place. Now tap down the slats in contact with former and lay on the bottom bar and solder in the same manner. Trim the ends and solder on the support bars.

The uncoupling gear, oil reservoir and brackets are self evident from drawings.

The ashpan consists of a piece of 20G brass bent up at each end and having sides brazed or riveted to it. The sides are of brass gauze or screen. The Ashpan rests upon the rear cradle and is merely slid into place the two angles shown acting as stops.

(Next Month—Assembly and Valve Setting.)

Mr. Coventry has kindly sent us some correspondence from a few of his customers who are building this famous Locomotive Model and we extract a few paragraphs which should interest our Model Locomotive Fans.

"Enclose remittance for Section 4. . . . the loco is coming along fine." K. Pitzer, Pomona, Calif.

"Am real pleased with castings and drawing, they are the cleanest and most perfect castings I have ever seen. Your instructions in The Modelmaker are so easy to follow. Have been building model steam engines and boilers for about 20 years so am perfectly familiar with this work." Geo. Bocklett, Winslow, Ariz.

"Enclose check for April installment. I really do feel quite proud, my frames, bumper castings, cylinders, went together with hardly any touching up. Your descriptions in The Modelmaker are really indespensable and mightily appreciated by me." Dr. Willis J. Bickford, Jr., Newburyport, Mass.

"Am enclosing remittance for sixth installment. Have had no trouble following your drawings and descriptions. They are very clear and precise." C. A. Purington, Marblehead, Mass.

"Stage seven completed. I placed finished cylinders on drawing and every point checked up. It is certainly a pleasure to work from such correct drawings, and your articles in The Modelmaker." Geo. R. Thomas, Brookline, Pa.

Change of Address. Please notify Us when you move. A few lines on a postcard giving your old and new addresses will greatly aid us and save us unnecessary corespondence in keeping our lists up to date.

BOOK REVIEWS

The Gas Air-Lift Pocket Book by Robert Stirling, 95 pages, 7 illustrations, with formulae and tables, and data sheets, 6¾ x 4¼" cloth, $2.00.

A practical guide to the oil fields Engineer in the application of the air-lift method to oil wells and also to the theorist in his endeavors to reduce the air-lift to an exact science. Contents: Theory and Working of the Air-Lift. Practical Working of Air-Lift Method. Practical Application to Oil Wells. Detailed Application to Oil Wells. Wells Producing Much Free Gas. The Real Gas Lift. Other methods of Using Compressed Air to Pump Oil Wells. Conclusion.

This is the first work that has ever been published on this important subject by an Engineer who has made a special study of it from a thoroughly practical standpoint, and it should prove a valued addition to the practice of oil well engineering.

We have had some inquiries for particulars on the construction of Model Rolling Stock. We would refer our readers to the February issue Volume 2, 1925 of The Modelmaker in which is a two-page detail drawing of an 80,000 lb. box car for ½" scale with descriptive matter by Mr. Roy Ashley of San Francisco, Calif. He put out sets of materials for this box car, also for a Caboose. Both of these models would be an attractive addition to any ½" scale Railway System.

Mr. John E. Waldo, 24 Alanson Road, Bridgeport, Conn. is very much interested in model railway work, and he would like to get in touch with any of our readers residing in his locality.

A MODEL "O" GAUGE RAILROAD, ELECTRICALLY OPERATED

By MR. LENOX F. BEACH, JR.

The model railroad about to be described is at present in a semi-finished condition, and for this reason the writer hopes that those fortunate enough to be the proud possessors of a complete system will not regard the illustrations with too critical an eye. The photographs will, however, present a general idea of the road, which is by the way, my first attempt at scale modeling.

The trackage is contained in a small room, about ten by fourteen feet, which necessitates fairly sharp curves and careful planning. One corner of the room is rendered unavailable by a closet, and two doorways further complicate matters. A continuous lay-out was therefore adopted, but disguised as far as possible to simulate a line running between two terminal stations.

Tables were constructed of well seasoned 7/8's wood to insure a firm and level roadbed. Each table is six feet or less in length, with the legs bolted in place, the tables also being bolted to each other. This type of construction allows the railway to be easily dismantled if the owner finds it necessary to change his place of residence, and facilitates, of course, rapid re-assembly.

It was decided to use curves of three feet radius or larger because of the limited space available. It was also decided to have the track as level as possible but due to the fact that the floor of the house was far from level, a few slight grades have crept in. These lend interest in working and are no disadvantage if not to steep. The track itself is of steel in three foot lengths spiked down to whitewood ties. Ballast consists of a very fine crushed rock obtainable at roofing contractors warehouses. The ballast shown in the photographs was much too coarse and has since been replaced. A discarded carpet was used to cover the baseboard and when painted in browns and greens forms very good "grass" and at the same time serves to keep the ballast in place along the tracks. This is well shown in the illustration.

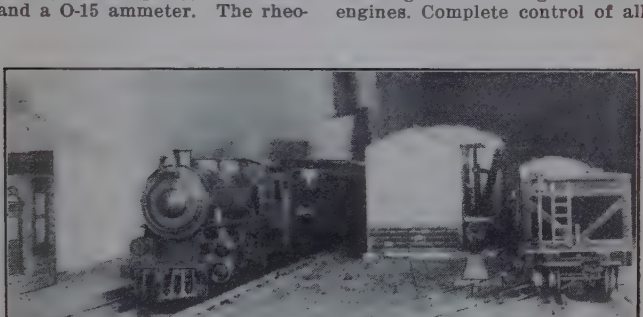
An outside third rail is employed, being located 3/4ths of an inch from the main rails and 3/16s above their level. The current collector consists of a small hinged shoe on the tender and operates to perfection. In appearance it is somewhat similar to the shoes used on automatic train control apparatus. The third rail is continuous at switches, a small ramp being provided to lift the shoe to the other third rail. This system provides absolutely continuous contact and locomotives can be operated at slow speed with heavy loads without any danger of short circuits or stalling due to interruptions of current.

The railroad is electrically operated, which provides high power and absolute control of all train movements. The current is supplied at twelve volts by two storage batteries in series. The batteries are connected to a small switchboard which also embodies a one ampere

charger, with the necessary switches. Such an arrangement makes it an easy matter to charge either battery without disturbing the working of the railway. Locomotives operate much more smoothly on direct current and its use is of course imperative for motors having permanent magnet fields.

Trains are controlled from a small panel containing a Federal current reversing switch (double throw, double pole), a rheostat and a O-15 ammeter. The rheostat deserves notice as it is capable of handling ten amperes without overheating and has thirty steps, providing extremely smooth control. It consists mainly of the commutator from an automobile generator which furnishes the contact points or the switch proper. From the commutator bars wires are led in cable form to a board mounted under the table. Number 18 resistance wire is located on this board and gives plenty of space for cooling and making connections. Locomotives can be operated from such a rheostat at very slow speeds, regardless of load, and the effect is just so much more realistic. The ammeter, also from an automobile, is of value in operating the line.

The trackage is subdivided into sections, each section being controlled by a radio type snap switch. Thus a locomotive can be switched off by cutting out the section on which it stands, allowing the running of other engines. Complete control of all engine movements from the control board is thus affected.



In addition, a heavy duty radio rheostat is connected in each conductor leading to the main line sections. Adjustment of these resistances allows trains to be operated with the main rheostat set in one position, the trains slowing down automatically for yards, switches, and so forth in a very realistic manner.

The rolling stock is at present somewhat limited, consisting of two locomotives and several

cars, passenger and freight. One of the locomotives is shown in the photographs, and the other is a Bassett-Lowke L.N.E.R. mogul type, electrically driven, which has been fitted with new cylinders and valve gear.

The 4—6—0 type illustrated was built by the writer before the track was laid and has been in steady operation for the past year without trouble of any sort. The model was built without the use of a lathe or castings, and was designed specifically to employ an old "Ives" motor unit and six "Ives" wheels which were at hand. This motor, by the way, had already given good service since 1915 and still will haul its twenty cars, which indicates that the contempt in which these "toy" movements are sometimes held is not always justified. This locomotive presents a rather good appearance on the track and rides remarkably smoothly at scale speeds of sixty miles per hour. Sheet brass was used principally in the construction, the cylinders, cab, frame, and tender being made of this material. Steel drill rod was used for hand rails as the strength of the material prevents damage to what are ordinarily easily bent parts.

An interesting feature of the design, and one which the writer has never seen elsewhere, is the construction of the crankpins. As shown in the small sketch, the pin is permanently riveted in the wheel and a small wire ring, fitted in a small groove around the outside end of the pin, is used to retain the side rods in place. With this construction the pin can never work loose as a screw might, with rather embarrassing results. The appearance, with no slot, is also better.

The hand operated reversing switch is carried in the tender and connection made from the engine by flexible rubber wires. The tender is of sheet brass with the floor made of ¼ inch bakelite which makes it easy to mount the collector shoes and any other apparatus which must be insulated. Lettering on the tender was done by means of a rubber stamp, printing from white enamel thinly spread on a piece of glass.

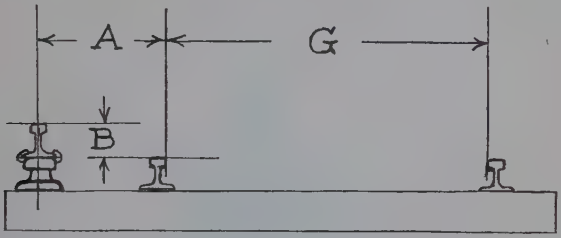
The chief dimensions of the locomotive are as follows: diameter of drivers, 1⅜"; wheelbase, 7"; diameter of boiler, 1¾"; gear ratio, 4 to 1.

Construction has been started on a Pacific type locomotive which will have the somewhat unusual feature of a motor in the tender driving the locomotive by means of a flexible coupling. The motor is a reconstructed "Bosch" windshield motor, a really high grade driving unit. Such a windshield wiper can often be picked up at a garage and will form an ideal means of propelling an "O" gauge model. The armature of the writer's motor has a diameter of 1 3/16", 1" face, seven poles, a rugged commutator, and a ¼" shaft. The motor is extremely powerful, so much so that it is almost impossible to stop it with the fingers.

In conclusion the writer wishes to emphasize the fact that this model was built in order to gain experience and ideas before attempting something more difficult; to see what could be done with cheap motor and wheels; and to provide motive power for a road under construction.

The writer in indebted to Mr. Andrew Connet for the photographs and wishes to express his appreciation of the painstaking work done by that gentleman. A good photographer is the modelmaker's best friend.

rived at after making a careful survey of 21 of America's leading electric railroad systems, using the top contact type of third rail. After averaging dimensions "A" and averaging dimensions "B", the nearest con-



	A	B	G
RECOMMENDED STANDARD FOR ½" SCALE MODELS	1"	¼"	2½"
ACTUAL AVERAGE FOR 21 LEADING AMERICAN ELEC. R.Rs.	24.13"	5.55"	4'-8½" (STD.)

STANDARD ELECTRIC TRACK 2½" GAUGE

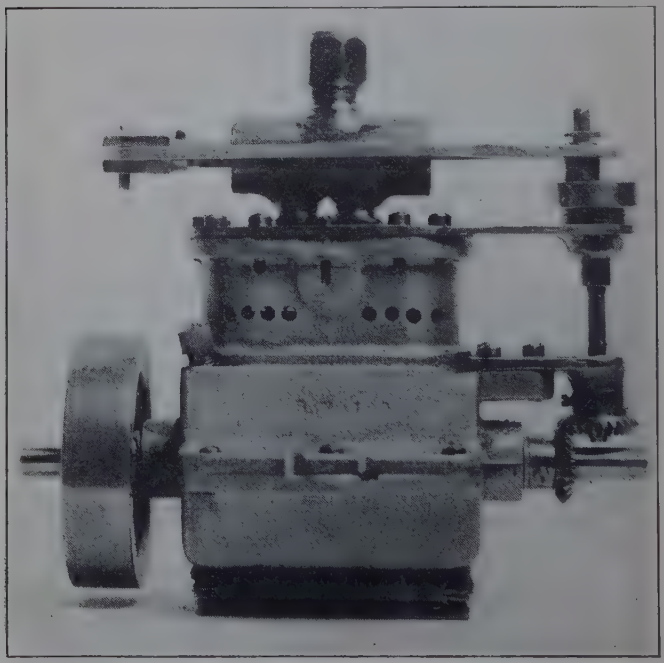
Mr. E. Jay Quinby writes us as follows: "I am enclosing a sketch showing the standard adopted for the top contact outside third rail location with references to the running rails. These dimensions have been arvenient nominal figures for ½" scale model construction were chosen for the "North Jersey" model road.

Any book mentioned in this Magazine can be supplied by Spon & Chamberlain, 120 Liberty Street, New York, N. Y.

TWO-CYLINDER, SINGLE-ACTING MARINE STEAM ENGINE

By MR. E. L. LUKE

I have not forgotten my promise to write a short description of the engine which we talked of and photograph of which I left with you, so here goes.



This engine was made specially for me by Mr. Bohaboy and is two cylinder, single acting piston valve, 15/16″ bore by ¾″ stroke built for flash steam.

The crank case is of aluminum, the cylinders are steel tubing pressed in, pistons are a special alloy having two cast iron rings on each. the piston pins are steel, connecting rods are bronze, forming their own bearing.

The crankshaft is turned out of solid steel and is 5/16″ in diameter, turning in tobin

bronze bearings. The flywheel is brass.

The interesting feature of the engine is the piston valve, cylinder and motion. The piston is of cast iron and is driven from the main shaft by bevel gears and the banjo shaped strap which is shown very clearly in photograph. The piston valve cylinder is of steel tubing as is also the ports, the whole being brazed to cylinder head plate. There is a row of auxiliary exhaust ports at the bottom of stroke.

The engine turns over very smoothly without much vibration, at 50 lbs. steam pressure with throttle nearly closed. The engine ran 3,156 R.P.M. and with 150 lbs. steam and wide open throttle speed was way beyond the range of my tachometer which was calibrated to 5000 R.P.M.

I super heated the steam until the steam line turned blue, which cut the lubrication down to the minimum. Ran the engine wide open for five minutes, engine stood the test very nicely and proving itself very reliable.

The features of the engine are lightweight, 2 lbs. for an engine with nearly an inch bore and developing, I believe close to 1/3 H.P. with the boiler I have planned for it, also the novel construction of the valve was very reliable.

Since the photograph was taken I have smoothed the castings and the engine now looks much more presentable.

NEW YORK SOCIETY OF MODEL ENGINEERS

A General Meeting of the Society was held on Tuesday, October 22nd, at the United Engineering Societies Building in New York City.

There was no business to transact. The Chairman announced that Mr. T. E. Singer had resigned as General Secretary of the Society.

A Financial Statement was read.

Mr. Oliver gave a report on the Publicity Work of the Society.

The meeting adjourned at 9.30 P. M. There were 20 members present.

CHICAGO SOCIETY OF MODEL ENGINEER'S EXHIBITION

The Chicago Society of Model Engineers are holding its twelfth Annual Model Exhibition from November 13th to the 16th inclusive, in The Republic Building, 209 South State St., Chicago.

Mr. S. C. Swanson, Secy., 5510 W. 64th St., Chicago, Illinois, will be glad to give particulars about this well-known Society to any Modelmaker who would like to become a Member. Their next meetings are November 28, Model Night. December 12, Mr. T. A. Ahlsgaard speaks on the subject of Thermo-dynamics of the Internal Combustion Engine.

We have just been advised by Mr. Walter Bosshardt, that his brother Adolph Bosshardt, Jr., has gone to Detroit, Mich., to work, and has taken his latest model boat, powered with his 4-cylinder gasoline engine, with him. No doubt he will find some kindred spirits to welcome him and his boat to that great port where he may meet with other power boats to race against.

NEW YORK SOCIETY OF MODEL ENGINEERS EXHIBITION

If there are any readers who have Models of their own construction that they would like to enter in this Exhibition either for Competition or Exhibition purposes, please write to the Secretary, Mr. F. D. Grimke, 21 East 87th Street, New York, N. Y., stating that you would like to exhibit some Models, and he will send you the necessary papers to fill in, with full particulars about shipping. Do this at once, because the time is getting short and the Secretary is anxious to get all the applications in as soon as possible, so that he can get the necessary information for the Exhibition Catalogue which has to be printed.

There are a number of Competitions open to any Amateur Modelmaker, and some prizes have been offered.

The Exhibition will be held in the Knickerbocker Building, Broadway and 42nd Street, New York City, from December 16th to 21st, 1929, inclusive. Open from 10 A. M. to 10 P. M. each day. This is in the very heart of New York City, and a very large attendance is expected.

There will also be a number of Trade Exhibits, which will prove of interest to Modelmakers.

The circular track will be in use certain hours each day, and Movie Pictures of Models will also be shown. Make a note of the date and the place, and do not miss this Exhibition.

When writing for information please enclose stamped and addressed envelope for reply.

Mr. Perry A. Ball, Public Service Office, Chicago Tribune, Tribune Square, Chicago, Ills., is planning out a model railway system, and he would very much like to get some information on scenic effects for such work. He would appreciate hearing from any of our readers interested in his subject.

We have just received a letter from the Publishers of The Model Yachting, in which they inform us that the subscription price for the combined magazine will be $2.00 per annum postpaid. It will be published monthly. This is the continuation of the magazine formerly known as The Model Yacht. We shall be pleased to receive subscriptions from any of our readers for this fine little yachting magazine.

Mr. L. G. Ackerly, Eastville, Va., has sent us photos of two of his ¼" Scale trolley cars he recently finished. One represents the Chicago North Shore and Milwaukee R. R. for double end operation. A 54' standard train car with two operating overhead trolleys, also third rail collectors. It has two Icken Motors operating through flexible drive on to each truck; both motors are controlled by one switch. The car is painted the same colors as the prototype. The other represents a Cincinnati, Hamilton and Dayton Railway car, with one Icken Motor, geared to front truck. It has overhead trolley, also collectors, for third rail, and can run either way. It is painted the same colors as the prototype, which are built by the J. G. Brill Car Co.

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Industrial Alcohol, the Manufacture of from farm produce, by F. B. Wright, plainly written, fully describing and illustrating the various processes. 271 pages cloth bound, $2.50. Spon & Chamberlain, 120 Liberty St., New York, N. Y.

Blueprints—Design for—Scale Model of Twin-Screw Yacht. 1 Profile and deck plan, size 13" x 22" 2. Lines, three views, 7¼" x 23". 2 sheets price $1.25 post paid. Spon, 120 Liberty St., New York.

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Hard and Soft Woods for the Modelmaker. Send for List No. M44. H. L. Wild, 510 East 11th Street, New York City.

One Set, ½" Scale, Six Wheel Passenger Trucks. New. Never used. Price $16.00. 5 cents for Photos. Chester L. Cobb, 37 Casco St., Portland, Maine.

Blue Prints of Ships — For Modelmakers, send for circular. G. B. Douglas, 165 Summit Ave., Upper Montclair, N. J.

Woodwork Joints, how to make and where to use them. 101 pages, 178 illustrations, paper, 35 cents. Spon & Chamberlain, 120 Liberty Street, New York.

The Barometrical Determination of Heights, a Practical Method of Barometrical Levelling and Hypsometry for Aviators. Surveyors and Mountain Climbers by F. J. B. Cordeiro, Second edition, revised and enlarged, 26 pages, cloth, 50 cents.

The Woodworker, a monthly magazine covering all kinds of work from simple carpentry to furniture and cabinet making, fully illustrated, single numbers 25 cents. Annual subscription $2.00 postpaid. Spon & Chamberlain, 120 Liberty St., New York.

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¼" Scale Drawings; Southern Pacific Series, Mountain, Pacific, Atlantic, Ten Wheel, Mikado, Mogul and Switcher type locomotives, $1.00 each. Four freight car set (Box, Tank, Flat, Gondola), $2.00. All types of locomotives and car drawings. George D. Arthur, Glenbrook, Conn.

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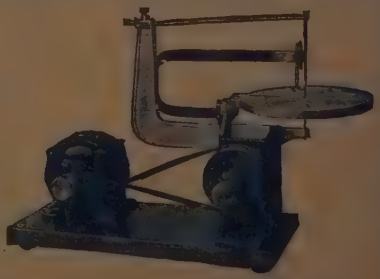

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VOL. VI, No. 12 December, 1929 10¢

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SPECIAL NOTICE

I have received enquiries for "O" gauge equipment locomotives, etc. Also electric models. Believing as I do that a sound business and reputation can be built only upon ethical principles and integrity both to customers and professional model makers or manufacturers, I wish to state that I do not make "O" gauge or electric and have no intention of doing so. Others are making excellent material in this line. All my products are original and all drawings are backed up with full sets of castings from my own patterns. I have no agents anywhere on N. American continent. Any parties purporting to sell my castings, or copies of my drawings, are unauthorized and fraudulent.

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THE MODELMAKER

FOR THOSE
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WORKING MODELS

Edited by

W. EDMUNDS SPON

VOLUME VI

SPON & CHAMBERLAIN

Publishers of Technical Books

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1929

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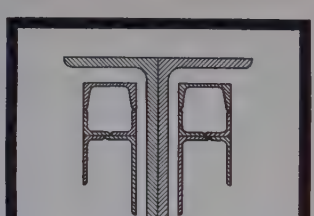

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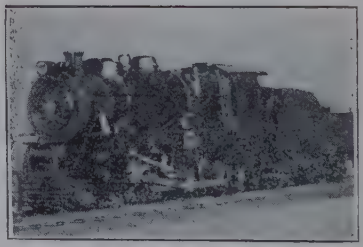

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THE MODELMAKER

Published by SPON & CHAMBERLAIN
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Editor—W. Edmunds Spon

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OUR FOREWORD

Old Father Time has just tapped on our office door, and handed us a card, bearing the two Mystic Signs—VI—12, and with a nod and a smile he passed on.

We look at the card a little sadly as we realize that another chapter has been finished in the life of the little "Modelmaker," and we are conscious of the many gaps and omissions that might have been avoided in that chapter, but as we listen to the Merry Chimes of the Christmas Bells we visualize the many pleasures enjoyed and the profitable hours spent in little workshops, in cellars, cupboards, kitchen tables, or garrets, where we have dreamed great dreams, and actually constructed a locomotive, a train of cars, a stately ship model, a snappy hull of a speedy power boat, a smoothly running motor, or a handsomely finished compound engine.

The hours thus spent, the efforts and expense have not been in vain for they have brought us welcome relaxation from the strain and toil of our daily life.

The efforts of "The Modelmaker" to encourage the novice and help in the development of Scientific Modelmaking have made their mark, and as the twelve numbers have been neatly enclosed in their cloth binding, and placed upon the Library shelf, the recorded efforts of our many contributors have been included in the History of the Art of Miniature Engineering.

We deeply appreciate all the help and encouragement these kind friends have given us in this good work, and in the pages of this volume, their names have been recorded. We feel proud to know that the Sun never sets upon these recorded efforts.

To our friends who have spent their money, and energies, in producing the materials and drawings for this work, and for their financial support in the advertising pages we make grateful acknowledgment.

To our faithful friends and subscribers who have materially helped us we extend our hearty thanks.

And to our Printers our appreciation for their promptness and good service.

Wishing our many friends, subscribers, and advertisers a Merry Christmas and a Prosperous New Year.

THE PUBLISHERS.

HALF INCH SCALE MODEL

B. & O. R. R. "President Washington"

By MR. H. J. COVENTRY, M.E.

(Continued from page 209)

Assembly and Valve Setting—After proceeding with the assembly one more item has to be made. That is the springs. If leaf springs are made to scale, it will be found that they are far too stiff; in fact, practically as good as solid metal dummies. There are two methods of making working leaf springs. One is to provide sufficient number of spring steel leaves to take the load and deflection, and interspace with strips of leather. Another method is to place washers between the leaves so that the overall dimension of spring is to scale. The sketch, Fig. 60, illustrates both methods. If the builder does not care to go to the trouble of making leaf springs, dummies may be used and spiral springs inserted in the buckles (see sketch), which in turn bear upon the tops of the spring saddles.

The two top leaves should be cut full length and the remainder graduated. Soften the extreme ends of the two top leaves, and cut out the center as shown on detail. This can be done with a punch same shape as slot. Place the spring on a block of lead, hold the punch in position and give it one good blow with a hammer. The piece will be cut out clean. A similar process can be adopted for the hole in center of spring leaves. The unannealed spring steel cannot be drilled but it can be punched in above manner.

The hoops can either be drilled and filed out of solid brass or 1/4x1/16" brass bent around a piece of steel and the joint soldered; see sketch, Fig. 61. The leaves, leather and hoop can then be rivetted together with the round head of rivet on underside and countersink head on top formed by the rivetting.

Now, we are about ready to put all parts together. It will be remembered that we already have the frames, motion beam, rear cradle, bumper, guide yoke and cylinders erected.

First locate the boiler and smoke box. Screw the furnace bearers on, one to the throat plate and the other to the backhead bottom flange. Now, place the boiler on the frame. If everything is ideal the two furnace bearers will seat nicely in the cradle, at the same time smokebox will be so located that the exhaust will be exactly on center line of stack. It is probable, however, that the ideal will not be attained, but we have two lines of compromise. The furnace bearers may be bent slightly, either backwards or forwards, and the position of stack may be shifted say 1/32" either way on smokebox as may be found necessary.

The stack should be located exactly on center line of exhaust pipe. To do this, turn up a disc and drill a small hole in the center to take the cord of a little plumb bob. Set the disc in the stack, and lock the

latter with the screwed draft pipe; locate the boiler so that the plumb bob is exactly over the center of exhaust pipe. Now, observe whether the furnace beavers are seating in the rear frame cradle. If they are, mark off the holes from throat-plate bearer with a bent scribe. The backhead bearer holes can be transferred direct with #44 drill, countersink, then #49 and tap 2/56". It may be found a little awkward to drill and tap for the throatplate bearer. It will be quite satisfactory if this bearer merely rests in place, and the boiler secured with backhead bearer. The cylinder flange should be drilled #42 and the holes transferred to the smokebox.

Now, take the boiler off and fit up the guide yoke and guide, the cylinders, pistons, covers, etc., being already assembled as a unit. The guide bars fit over the lug of back cover, and are held here by a #0-80 screw tapped into inner guide bar. The two halves of the guide are held together with two 0-80 screws and the outer bar is tapped on top to receive the screws passing through the guide yoke. Of course, the guide must be fitted so that the crosshead slides freely. This can be accomplished by carefully scraping away the surfaces of lug on cover and end of guide yoke. If undersize already shim up with thin shim brass or copper.

Before going any further, slip the main driving wheels and boxes in place and then put the main rods on; turn over to see if proper clearance exists between covers and piston. There should be 1/32" clearance each end of stroke. If this is correct, remove the rods, and turn the frame upside down, support at ends. Handle carefully now as it is an easy matter to bend a frame of "bar type" with the pedestral binders off. Put the frame fillers in place and all the spring rigging for drivers. Then, put the three pairs of drivers in place, observing that the boxes slide easily, and then put the pedestal binders on. The side rods may now be put on and the wheel turned round. If the rods stick on dead centers, first find out which of the four rods is causing trouble. Also test out the quartering of the wheels. If the quartering is correct, try the front or rear rods each pair separately, and by this process of elimination the offending rod can be discovered. A slight amount of easing out the bush with a small scraper should rectify the trouble if the previous work has been done correctly. Full size locomotive rod bushes are bored as much as 1/32" over size when new, so do not be alarmed if the rods will not pass over dead centers due to too good fits.

When the rods are fitted correctly remove the wheels and proceed to assemble the brake rigging. Brake cylinder should be located and holes tapped from frame. Piston rods brake levers brake lever fulcrum shaft and brackets may be fitted up. The equaling beams pull rods and brake beams may be assembled as a unit and then placed in position on frame by means of the brake hangers.

Valve motion may now be erected. Take the piston valve and steam chest head out, and take the valve spindle crosshead guides off the head. Now set the valve on the spindle, tighten the nuts, slip the steam chest head on the spindle and

screw the little crosshead on the spindle so that the center of hole for combination lever is 1-25/64" from outer edge of valve. This dimension may have to be changed when setting the valves, but it is near enough to start out with. Now, put the combination lever in place, also the radius rod. The pin should be an easy fit through the crosshead. Next, put the whole unit back in steam chest, and screw up. A pair of tweezers and a little patience will get the top screw in, and also it will be apparent why the crosshead guides were removed. These latter can now be put back, and the combination lever coupled up to the union link and crosshead. The radius rod is next connected with the expansion link and die block, and then the reverse shaft, reverse arms and lifting link coupled up. Put the side rods on, also the main rod, then the eccentric cranks.

Now, it will be necessary to locate the eccentric crank arm in proper positions to give correct travel of expansion link. First, set the main crank pin on front dead center. To do this run the piston rod in and make a mark on crosshead and guide bar. Also at same time make another mark on rim of wheel with the surface gauge. Turn the wheel over till the mark on crosshead passes the one on guide bar and continue turning in one direction till the marks coincide again. Now, make another mark on rim with the surface gauge. Divide the distance between the two marks, which will give the dead center. Bring the wheel around so that this point registers with the surface gauge needle and the engine will be on dead centers.

The surface gauge should be set to axle center during these operations. Now with the crank on front dead center, push the eccentric crank arm on to end of main crank pin. We have next to set the crank arm at right angle plus a small amount to compensate for vertical distance of end of expansion link above the engine center line.

This will automatically be taken care of if the center of eccentric crank pin is set .35 above the center of axle. If you have no rule divided in hundredths set mid way between 11/32" and 23/64". Tighten up the bolt in eccentric arm. Now, when the engine is on dead centers, the eccentric arm is exactly in the middle of its stroke and consequently the expansion link is also and again in this position if the radius rod is moved up and down the slot no movement whatever is given to the valve stem. This feature is common to all radial valve gears and forms a test of the accuracy of the related parts. Therefore with the radius rod in place, set the link so that no movement is produced when the radius rod is moved up and down the slot. Now, measure the distance with a pair of dividers from center of eccentric crank arm pin to the center of hole in end of expansion link. Transfer this to the eccentric rod which, it will be remembered, we left undrilled at fork end. Center pop and drill for the screw and connect up.

If everything has been done correctly so far, the valves should be very close to correct setting. For final check, connect up an air supply (foot pump and small tank will do), or auxiliary boiler, and try the engine over. Open the front drain cock. With crank on front dead center the air should is-

Fig 60

Fig 61

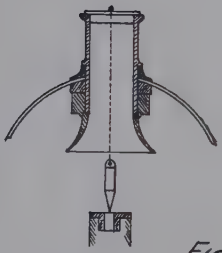


Fig 62

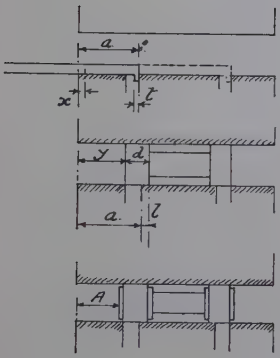


Fig 63

PORT WIDTH = $x + l$

$y = a + l_{ap} - d.$

Fig 64.

sue from the cock; turn the wheel over in forward direction with radius rod in bottom of expansion link and air should continue to issue until the piston has reached about 85 or 90 per cent of its stroke. Open the back cock now, and continue to turn the wheel over. The piston should almost reach the end of its stroke but not quite before air starts to issue from back cock. A low air pressure is all that is necessary; that is, not sufficient pressure to drive the engine. If adjustment of valve is necessary, screw the valve spindle into or out of the crosshead with a socket wrench applied to nut on front of valve spindle.

If any error has been made in width of port or relative location, find out what the exact dimensions are, and a little hook gauge is useful for this. (See sketch.) Push the hook in against the inner edge of port, and make a mark on the gauge flush with face of chest, pull back till hook is bearing against the front edge of port and mark again. This will give the width of port, also its distance along the bush. Do the same for both parts. Measure the widths of valve rings, also the width over the face of valve spool flanges. Now, we are in a position to check up.

Add the distances over valve spool flanges to the widths of rings. This should equal the distance between outer edges of ports. If it is slightly less no harm is done, as this will form "exhaust clearance" or "negative lap," thus reducing compression at end of stroke by delaying exhaust closure. Negative lap must not be overdone or "expansion" will be reduced.

Knowing the various dimensions as they really are, it is an easy matter to figure up what the distance A, Fig. 64, should be to place the valve exactly over both ports. Set the radius rod in mid gear and the engine in mid stroke, the combination lever will be vertical and crosshead in middle of its stroke. Put the valve in chest and screw the spindle into crosshead till the valve indicates the dimension A. Now use the air and go over the gear as described above.

The engine can now be run from an auxiliary air or steam supply, but first give the cylinder and motion a good oiling. The exhausts should be clear and even. If not, check over the valve setting. See that the nuts each end of valve spool are tight and that the valve spool flanges are smaller than the steam chest bore. A bevel turned on edge is beneficial. Plain plug valves without rings are easily and quickly made and are quite suitable if the model maker does not care to make rings or desires to experiment with different amounts of lap.

Having the valve gear satisfactory, the boiler can be mounted. A brown paper or asbestos paper gasket should be laid on the cylinder saddle, first smearing both sides with graphite and boiled oil. The smoke box should be air tight.

Couple up the steam pipes; the running sleeve and lock nuts will give the correct adjustment for the union to steam chest. Connect up the "air reservoirs," which are lubricated by running a 1/16" pipe from the 5/32"-40 tapped hole in steam pipe boss to the top of tank. First make a little nipple of

3/16" hexagon brass screwed 5/32" and drilled 1/16". Solder the pipe in, screw into the boss and solder the other end into the tank. A small needle valve may be placed in the pipe line if desired. Connect up the blower line and solder the end of pipe into the boss on exhaust pipe, or a small union can be made and connected up.

The injector may be placed along side the firebox or under the cab deck and connected to check valve and top feed. The delivery from injector is connected on left hand side of boiler, while another delivery pipe is run from top-feed connection on right hand side which is hose connected to the pump in tender.

For testing purpose, this can be connected to a separate pump and water supply or testing of engine can be left till the tender is made. Probably, however, when this stage is reached, the builder will not feel disposed to wait for the tender but will be anxious to get the model runing under her own steam.

Everything being satisfactory, all screws tight and pipe connections sound, pump a few pounds of air in through any boiler fitting, the plugs at top of turret and feed connection are good points to connect. Pump in about 25 or 30 pounds. Open and shut blower valve, injector steam valve, gauge glass and brake valve. This will prove whether all passages and pipes are clear. Put the reverse rod in full forward gear, open the drain cocks and then open throttle a little. Shut the cocks and open throttle wider; the engine should turn over evenly. Try both directions. The engine should, of course, be supported clear of the rails. During this test the wheels merely running light.

To test under steam, fill boiler with hot water two-thirds up the gauge glass. Connect the blower elbow at smokebox with air supply or pump or separate steam boiler. Break up some charcoal not too small, about size of a peccan nut, put them in a wire basket and hold over the gas flame till well alight. Shovel them in the firebox. See that the grate is covered and turn on the air to blower. Put in some more charcoal, larger pieces, and as soon as the pressure gauge needle shows a few pounds, take off the air supply and turn on the steam blower. Pressure will rise steadily. While doing so the throttle may be "cracked" (Just open) and cylinder cocks opened. This will warm up the cylinders and avoid the greater part of condensed water going up the stack, which would happen if full pressure was applied to cold cylinders. Look to the water gauge as the level will probably be lowered by this time. Close the throttle and raise the pressure to 80 lbs. Try the injector, open the steam valve. It should "pick up" quickly after a preliminary splutter from the overflow. The cold water supply should be level or higher than the suction. Test the brakes over by opening the valve and adjust the first pull rod nut if necessary. Shut off the steam and the auto drain cock takes care of the exhaust from brake cylinder while the spring releases the shoes. Everything is now clear for a test stand run. Open the throttle and let her accelerate, "notch up" the reverse gear, and open throttle more. Let the en-

gine run in mid gear for a time, but do not forget the water level. Track running with load must be delayed till the tender is finished, which will be described next month.

A PACIFIC GARDEN LOCOMOTIVE

By Mr. Elmer S. Johnson

I am building an Amusement Park Model Locomotive, 4-6-2 Pacific type from my own designs and drawings. I also made what patterns were necessary and am doing all the machine work myself.

Particulars

Gauge—14"
Cylinders 3¾" bore by 4⅞" stroke.
Driving Wheels, 14" dia.
Tender Wheels, 6" dia.
Bogie Wheels, 4½" dia.
Length of Locomotive without tender, 84".
Length of Tender, 48".
Height of Engine from rail to top of boiler 37".
Length of wheel base 48".
Walschaert Valve gear.
To operate on 150 lbs. steam.

A locomotive of this size is capable of hauling three or four small passenger cars, at a fair rate of speed.

Mr. Roy Ashley writes he is at work converting an English Great Northern Atlantic Locomotive of 3¼" Gauge into an American Locomotive for Mr. A. R. Herner of Ahwahnee, Calif. We would be interested to know if this is one of the locomotives used at Treasure Island in the grounds of the late Philadelphia Exposition. We understand this rolling stock was sold to some Western concern.

The following is an extract from a letter from an Instructor of Metal Work in a prominent Industrial Institute: "I recently purchased a complete set of the materials and drawings of the Coventry ½" scale B. & O. President Washington Locomotive, to be built in our Shop. We have organized a regular shop plan, that is, I have appointed a machinist apprentice (railroad) as a shop Superintendent, and one as a shop foreman, then we have a crew of six machinist apprentices who meet on Tuesday and Thursday evenings from 6:30 to 10:30 P. M. These boys are going right after it, and are getting a lot of experience and fun out of it. I can hardly make them stop work at 10:30. We use The Modelmaker for our lesson sheets and I want to say it works very satisfactory. Of course we have all the different machine tools in our shop, so we naturally do the job the most convenient way."

Mr. F. W. Icken has promised to write a series of articles on the construction of a Model "O" Gauge Electric Locomotive with the necessary illustrations. These articles will be published in forthcoming issues of The Modelmaker.

Change of Address. Please notify Us when you move. A few lines on a postcard giving your old and new addresses will greatly aid us and save us unnecessary corespondence in keeping our lists up to date.

A VISIT TO ICKEN-BARKER MODELS

At. Mr. F. W. Icken's invitation, the writer paid a visit to their new workshop at Ridgefield, N. J. The shop is located in a new factory building, one block from the Erie Railroad Station.

The shop is fully equipped with all the necessary machinery and tools for their special line of work. The writer was also shown numerous jigs and templates that are necessary to turn out the various finished units and parts used in the construction of their models.

The aim of this firm is the production of working models, built to scale, utilizing the most suitable materials, coupled with excellent workmanship and finish. Certain prototypes are selected as the result of the firm's "contact" with the modelmaker, or in a great many cases, the prototype for the model locomotive is selected by the purchaser.

Mr. F. W. Icken has personal charge of the designing and electrical work, while Mr. Geo. Barker, an expert precision instrument maker of many years' experience, has charge of the constructional work.

They have been busy for months on the construction of both "O" gauge and ½" scale locomotives and finished parts, and the orders they now have on hand will keep them actively employed for some time, the bulk of the work being for private clients.

Many of these locomotive models are in operation on model railroads in various parts of the country, giving excellent results. Four model locomotives are operating on a system in South Jersey, three on a line in Chicago, others in Connecticut, Minnesota, Ohio, New York, etc., and in every case where additional locomotive equipment has been required, repeat orders have followed.

A number of the locomotives are of steam outline, having full Walschaert Valve Gear, all the main working parts being reproduced. The material used for this purpose is German Silver. All the models employ the Icken Electric Drive, together with the special Equalizer System for the driving wheels. Numerous other types of locomotives are reproduced including the true electric type, Oil Electric, etc. In addition, passenger cars of the Multiple Unit and Gas Electric types are built.

The following list of models give some idea of the firm's activities, viz.,

2-8-8-0 Steam Outline (electrically driven) "O" gauge, Mallet type, operated with two motors, fitted with two eight wheel engine trucks, all the usual fittings. Operating voltage, 10 to 12 DC, 15 to 17 AC. For heavy freight "banking" service.

PRR K-4s Pacific type, 4-6-2 (electrically driven), "O" gauge. Driven by one electric motor for operation over a line having either 10 to 12 volts DC or 15 to 17 volts AC. Used in "Heavy Passenger Service." Can handle

train weighing from 18 to 20 pounds.

PRR G5s Class, "Ten Wheeler," fitted with one motor, used for heavy "suburban traffic," or "mixed traffic." Operates on 10 to 12 volts DC and 15 to 17 volts AC.

P & R "American" type, 4-4-0, fitted with one motor used for light "local" trains. This is a special little model, and the writer witnessed a demonstration of this loco hauling a four-car train over a line with a fairly "heavy" grade and with a sharp curve at the top. The locomotive operated on 12 volts AC. Usual operating voltages are 6 to 8 volts DC, 10 to 12 volts AC.

Standard 0-6-0 Switcher, which follows a most modern type, having a high pitched large diameter boiler. Fitted with one motor operating on either 10 to 12 volts DC or 15 to 17 volts AC. This locomotive is capable of handling a train of twenty cars, the test train consisting of thirteen freight cars and seven passenger cars. Fifteen of these cars were fairly heavy built scale models.

All the above models have Walschaert Valve Gear, together with all the usual fittings. Either "inside" or "outside" third rail shoes are fitted.

True Electric or Oil Electric Types

Electric Switching Locomotive, having one motor operating on either 10 to 12 volts DC or 15 to 17 volts AC. Quite a number of these locos are under construction. All truck wheels are "drivers."

Electric Passenger Locomotive, fitted with one motor driving all eight wheels. Built for "Heavy" passenger traffic. Operates on either 10 or 12 volts DC or 15 to 17 volts AC.

Gas-Electric type Passenger Coach, fitted with two motor-driven trucks, arranged for operating on either 6 to 8 volts, or 10 to 12 volts DC, with corresponding AC voltages.

Multiple Unit or Gas Electric cars can be fitted with either one or two motor-driven trucks. A single motor driven truck car being capable of handling one trailer while a two-motor driven car can handle from two to three trailers.

The Electric Locomotives and the Multiple Unit cars can be fitted with either third rail shoes or Pantagraph (or a combination of both) collectors.

Mr. Icken informed the writer that it has taken considerable development work to reach the present style of construction, so that prospective customers can be assured of models that can stand up to the "Performance Counts" test.

Mr. C. Holt of Greenwich, Conn., has sent us some transfers of names in gold and silver for use on Railway Cars, Locomotives, etc. They certainly look very nice, and those interested should write to Mr. Holt and ask for full particulars.

How to make Old Time Ship Models is the title of a new work by the well known Modelmaker and writer, Mr. Edward W. Hobbs. It will be the same size as his work on English Clipper Ships with 208 pages of text and numerous illustrations, price $5.00. We shall have copies shortly, and shall be pleased to supply this book to any of our readers.

AN ELECTRICALLY HEATED STEAM BOILER

BY MR. P. HARRY SQUIER

Ever since the writer used open barrels of water as an artificial load for testing heavy railway motors some twenty-five years ago, he has had a desire to build a model steam plant whereby the steam was produced by passing the electric power directly through the water to the shell of the boiler. An extensive experience of small boiler making of both fire and water tube types, one of which was illustrated in The Modelmaker of August 1927, was useful in laying out the job, but the mechanical problems to be overcome were entirely different than those met in making a boiler for orthodox firing.

As far as the writer is aware, no description of such a small boiler for raising steam as here described has ever been published, but he does know that in some of the modern paper making plants recently put down in Canada, where water power is plentiful and fuel is scarce, such boilers have been built on a large scale and proved very successful. In a model boiler such a source of fuel has several advantages, cleanliness, s a f e t y from fire, and all danger of burning a dry boiler, to mention only three.

The sketch shows in cross-section the general construction of the steam generator. A piece of drawn brass tubing 4" in diameter, 9" long and 3/32" thick, constitutes the main barrel. Into the lower part near the end is riveted and sweated a truly turned plug of brass ¼" thick, making an open container similar to an ordinary coffee can.

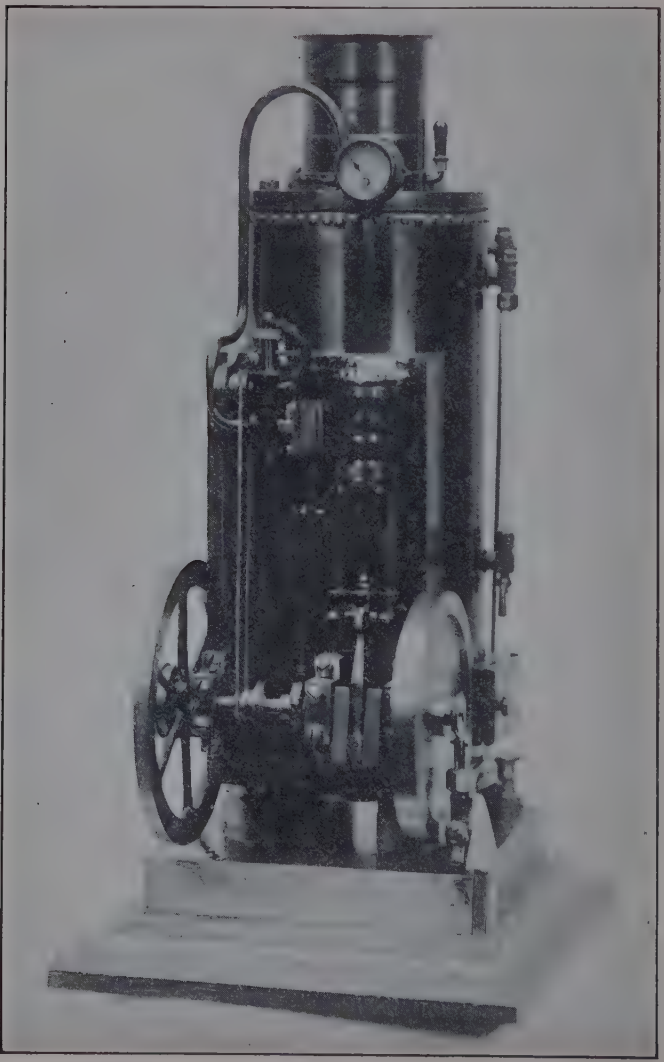
The inside electrode is a piece of plain brass tubing 7" long by 2¼" diameter No. 16 BWG anchored centrally by rings of soft rubber turned in a lathe to prevent any possibility of its coming in contact with the bottom or sides of the boiler shell. The rings were made from an old block of rubber from a rivetting hammer or a piece of rubber mat would answer.

This inner tube is inserted after the brass ring—for the top cover has been fastened in place. The rubber rings can be squeezed in past this ring. The top and bottom of inner tube must be equidistant from top and bottom of boiler tube.

Boiler should be three quarters full of water. The water gauge will show the amount of water in boiler.

The most difficult problem was to make the upper or removable end of the boiler, sufficiently strong and steam tight to withstand a pressure in excess of 100 lbs. to the square inch. This was accomplished by riveting and sweating a heavy turned brass ring ¼" thick by ⅜" wide inside the upper end of the boiler shell, to which was secured the top cover plate of ¼" brass by means of 16 10-32 flathead brass screws, with a rubber gasket in between. Under a test pressure of 160 lbs. this was absolutely tight and no joint showed any signs of distress.

An ordinary motor car spark



plug, turned and threaded to special size, was used to convey the electric current through the boiler head to the water electrode. A test pressure of 220 volts showed perfect insulation. This spark-plug is concealed in the smoke stack and cannot be seen in the photograph of the finished model. The electric conductor is brought from an insulated terminal on the base of the boiler through a copper pipe passing through a hole in the smoke pipe to the spark plug, making a neat job and giving mechanical protection. The other terminal is secured to the brass bed plate.

The boiler is equipped with the highest grade fittings, consisting of spring loaded safety valve, water gauge, with blow off cock, whistle, stop valve, and pressure gauge reading to 120 lbs. Due to water having a high resistance when cold it takes a few minutes to reach boiling temperature, but once heated, steam is made in great volume. The safety valve is placed on the top of the boiler and set to blow at 70 lbs. and with the engine going at full speed under load, 110 volts on the terminals makes the safety valve lift continuously.

A plunger type feed water pump is driven by an eccentric off the engine shaft, passing water to the boiler through a Bathe non-return valve.

The engine is double acting slide valve, with cylinder of cast brass ½" bore by 1" stroke. The crank shaft was cut out on the lathe from solid steel to extreme accuracy. Two heavy brass flywheels 4" diameter and a Vee Pulley are fitted to the shaft, and the governor is set to control the speed at about 1200 revs. per min.

This miniature centrifugal ball

type governor was made by Whitney of London, and is a marvelous piece of fine work. It has only recently been put on the market and when the writer was in England this summer he secured one for building into this model and finds it to operate very well.

The whole steam plant is mounted on a massive brass base above a teak and aluminum foundation, making it operate with no vibration, and giving the model a very fine appearance.

Total weight including water, 31 lbs.

[The Sketch referred to in this article, will be published in the January issue.—Ed.]

Mr. Chas. A. Cole of Ventura, Calf. writes us that he called a meeting of Modelmakers in his locality, and they met in the Chamber of Commerce Building, Los Angeles. There were 22 present. Mr. J. R. Fisher, 310 W. 63rd Street, Los Angeles, was elected Secretary. Two Committees were appointed, one to consider and recommend a Constitution, the other to arrange a place of meetings, dues, notices, etc. In the meantime Mr. Cole made a display of models in a store window in the heart of the city, and by this display obtained 150 names of men interested, but not in time to advise them all of the next meeting. At which meeting there were 50 present, and the officers were elected and name chosen. This looks like a splendid beginning, and we wish the "Los Angeles Society of Model Engineers" every Success. We would suggest that all of our readers residing near Los Angeles get in touch with the Secretary, and ask for full particulars.

SCALE MODEL AIRPLANES

BY MR. G. R. WHITAKER

Scale model airplanes are perhaps the easiest things on earth to talk about. Everyone interested in aviation is interested in the doings of the various model aero clubs throughout the country.

Up to now scale models have been heavy affairs. Being built of spruce, pine, basswood or what have you, they couldn't be light. They were strong, and they had to be. But now the modern model has almost entirely replaced the "Old" ships.

The featherweight Balsa wood has come into its own, and here is where the story of Columbia models begins.

The first step in building these planes is to get all of the parts together. The motor, propeller, and wheels. The wood must be cut and shaped. Then we are ready to begin.

The first thing to be done is to make the body sides. These are made from a standard template, insuring their all being alike. After sanding, they are "Cut." By "Cutting" we mean they have the windows cut out, and all other necessary cuts made. Next the bulkheads are made, from patterns.

Five to six of these bulkheads are used. They vary in size, so that they are smaller as they are placed in the body, from nose to tail. In gluing up the body, the two main braces are inserted and glued. The others are then put in, after the first two are dry, in the same manner that the main ones are attached. Last but not least the ends of the body at the tail are glued together, and the body is ready for the motor. Before the motor is installed, the fuselage is covered with silk. It is then doped and painted. Then the landing gear, motor, braces, and tail group are attached. It would take too much space to describe all of the steps in making and attaching these various parts, so we will assume that they are all ready made, as they are in the knock-down sets.

After the fuselage is finished the wings are made. Twenty ribs are cut from a standard template, and drilled and slotted for the spars. Ten ribs are placed in each wing. Two at each end, and the rest equally spaced in between. When the ribs are in place the leading and trailing edges are attached. The top spar is glued in next. Now the fun begins. The Drag bracing, in the wings, is serving a dual purpose. First it prevents warping, and second, it helps prevent breakage. The drawings are the only things that will clearly explain this process. The hinged flap on the rear edge of the wing, is made like a little wing. The hinges are made of celluloid tubing and piano wire.

The wings are covered with china silk. The covering is "Doped" on, and given a coat of silver varnish. They are next attached to the fuselage by means of the small hinges supplied. The struts are glued to their respective hinges, and wing sockets.

These planes are finished in colors, either red, silver, blue, green or orange, and combinations of these colors. The wings are all silver, and so are the elevators. The rudder is left plain, and undoped to prevent warping. Adjustable stabilizers are used to balance the plane in flight.

The total time required to build these planes is about twenty to twenty-eight hours. Some people can build them in a day. But a plane is only as good as its pilot, whether it was built in a day or a week.

Goodell-Pratt Company are sending out a very clever illustrated circular called "Mr. Punch." We are sure our readers would be interested. Write for one.

BOSTON ASSOCIATION OF MODEL ENGINEERS

The monthly meeting was held on the evening of November 12th, at 8 P. M. at 246 Huntington Ave., Boston, Mass. Mr. G. F. Cusick took the chair.

After the roll call the Secretary's report and the Treasurer's report were read.

Motion made by Mr. Cusick that a letter of thanks be sent to the N. Y. S. M. E. for their offer of Exhibition space at the Model Exhibition to be held in December. Also a request for a Catalogue of said Exhibit. Seconded by Mr. Purinton.

The Committee on by-laws made a report which will be voted on at the Annual meeting.

Motion made by Mr. Purinton that the second Tuesday of every month, hereafter, shall be the regular meeting night. Seconded by Mr. Blake.

Motion made by Mr. Cusick that the first Annual meeting be held on Tuesday evening, January 14, 1930. Seconded by Mr. Purinton.

Motion made by Mr. Purinton that a letter of thanks be sent to Mr. V. V. Hubbard for the use of his Office as a meeting place. Seconded by Mr. Brackett.

Mr. Blake donated the membership cards which will be distributed at the next meeting.

The next regular meeting will be held on Tuesday Evening, December 10, 1929, at 246 Huntington Ave., Boston, Mass., at 8 P. M.

The following information sent us by Mr. E. P. Alexander, we are sure will interest model railway fans, relating to the naming of cars. Pullman Names on the Broadway Limited, P. R. R.: 12 section sleepers—William Penn, Ethan Allen, Thomas Paine, Nathan Hale, Henry W. Longfellow, James Russell Lowell, Ralph Waldo Emerson, etc. Compartment cars: Penn Square, Times Square, Independence Square, Franklin Square, etc. Club Cars: Liberty Bell, Liberty Boys, Liberty Cap, etc. Observation Cars: Federal Hall, Independence Hall, Carpenter's Hall, Faneuil Hall, etc. On the 20th Century Limited, N. Y. C.: Adirondack, Westmoreland, Espanola, Mohawk, Star Glen, Star Beam, Star Dust, Star Crag, Star Valley, etc., Centglen, Centoys, etc.

After January 1st, 1930, the American Model Railway Company expect to be in new quarters at 30 Avon Road, New Rochelle, N. Y., where they intend to lay out a complete model railway system to be known as the "Penn-Eastern System."

AN ELECTRIC GARDEN RAILWAY, HALF INCH SCALE

BY MR. E. JAY QUINBY

The illustration on the front cover shows one of the Electric Cars of the ½" scale model electric railroad equipment I have been working on. The system is laid out around my Westchester residence, outdoors. While not yet completed, the work, as you will see, is well under way. It is a replica of the North Jersey Rapid Transit railroad, which ran from Paterson, N. J. to Suffern, N. Y., over a private right of way. Some years ago, the writer was employed on this road, in various capacities, and this spring when the road was being dismantled, made a special trip over the line, taking motion pictures.

The model road is about one "scale mile" long, and will be operated part way by third rail and part way by overhead contact wire. It is a single track line, with turn-outs and automatic electric block signals.

The passenger equipment consists of multiple unit interurban cars, and other equipment includes freight cars, electric locomotives, work car, etc.

It may be of interest to note that the tedious work of spiking down the rails to the thousands of ties ballasting the line, etc., was all done by the youngsters of the neighborhood, who take a lively interest in the project. The problem of "missing" equipment is very nicely overcome by making each and every one of these youngsters a real stockholder in the road.

Evergreen shrubs and barbery hedges lend a touch of realism to the scenic effect on this road, as it winds about the lawn, and as weatherproof materials are used throughout, everything is built permanently in place.

Mr. Calvert Holt informs us he is very busy on the construction of special Models for private customers. He is building up a reputation for high grade models of the best materials, design, and workmanship, and the results in increased orders and new customers have been very gratifying.

Mr. Edw. H. Cook of Model Boat Works writes us he is building a complete New Haven System, and will be able to supply all kinds of freight cars, either complete or construction sets.

New York Society of Model Engineers Exhibition will be held in the Knickerbocker Building, Broadway and 42nd Street, New York, N. Y., in Rooms 327-338, from December 16 to 21, 1929, inclusive. Open from 10 A. M. to 10 P. M. each day. Be sure not to miss this Exhibition.

Our readers who have a Wade Lathe should write to The Gerold Company and get a descriptive circular of the Compound Slide Rest, which is especially made for this Lathe. It is certainly a fine piece of machine work and will add greatly to the scope of this fine little tool.

THE MODELMAKER CONTENTS OF BACK VOLUMES

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The Construction of Model Marine Steam Engines, including single and two cylinder engines with link motion and without. Radio Fundamentals, a simple explanation of apparatus and its use. High Speed Racing Boat Model. A Model of Pennsylvania Railroad Locomotive 4—6—2, Passenger class K 4s, ½ in. scale. Switcher Locomotive, ½ in. scale, operated by steam or electric drive. Atlantic Type Locomotive. 1¾ in. Gauge. 3 30-Lever Interlocking Switch and Signal Tower Frame. Pennsylvania Railroad Passenger Locomotive. 4—6—0 Class G. 5 s, scale 7/16 in., gauge 2 in. Inter-Lake Yachting Association Put-in-Bay Model Power Boat Races. Walking Beam Side Wheel Marine Engine. Model Engineering and its Development in America. A Design for a Model Cargo Steamer, News Items. Book Reviews. Societies. Question Box. Index, 114 pages, 26 illustrations and scale drawings, 7¼ x 5¼ in., cloth $1.60.

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A Bench Shaper. High Speed Steam Engine, 8-cylinder uniflow, poppet valve type, Detroit Model Yacht Club Rules and Power Boat Races. Toledo Model Yacht Club races. Pullman Chair Car Model "Wyoming," gauge 4¾ in. Model 80,000 lbs. Capacity Box Car, ½ in. scale. Model of Admiral Nelson's "Victory." Notes on Construction of Pennsylvania Locomotive, K 4 s ½ in. scale. A Twin Screw Gear Box. Two-cycle Marine Type Single Cylinder Gasoline Engine. Model Tug Steam Plant. Model 110-Volt Electric Locomotive, 2—4—4—2, 1¾ in. guage. Model Shipbuilding Notes, Construction of Sheet Metal Hulls. Model Locomotive Kinks. Mr. L. Lawrence's English Passenger Locomotive, 4—4—2, 2½ in. gauge coal fired. A 4—8—4 Dominion Type 3-Cylinder, Heavy Duty Tank Locomotive, 2½ in. gauge. What Modelmakers require. Models of Old Ships, High Speed Horizontal Single-cylinder Double Acting Steam Engine ¼ h. p. 1¼ in. bore by 1¾ in. stroke. Models and their Costs. Locomotive Steam Distribution. The Boston Model Yacht Club. Model of Amoskeag Steam Fire Engine. A 4—6—2 Pacific Type Locomotive, 2½ in Gauge Dynamic Operation of a Locomotive. Design for a Scale Model Twin-Screw Yacht. Model of 4-Cycle Gas Engine. Modelmakers Lathe. Locomotive Valve Gears. Sensitive Drilling Press. Liquid Versus Solid Fuel for Model Locomotives. Drill Vise. Marblehead Messenger Model Yacht Regatta. Dimensions of Class K. New York Central Railroad Locomotive. High-Speed "Uniflow" Stationary Steam Engine. Single-cylinder Horizontal Automatic Steam Engine. Canadian National Passenger Locomotive, Mountain Type 4—8—2, 6,000 Series. A Mecca for Modelmakers, 4 Cylinder Gasoline Engine, 2-cycle, air cooled. Model of U. S. S. "Wyoming." Passenger Locomotive 4—6—0, 1½ in. Scale, 7¼ in. Gauge. Model of S. S. Aquitania. Model of U. S. S. Frigate Constitution ("Old Iron-

sides"). 'Los Angeles "Evening Herald" Model Yacht Regatta. Models of Donald McKay's Clippers. News Items. Book Reviews. Societies. Index. 208 pages, 46 illustrations and detailed drawings, 7¼ x 5¼ in., cloth $2.10.

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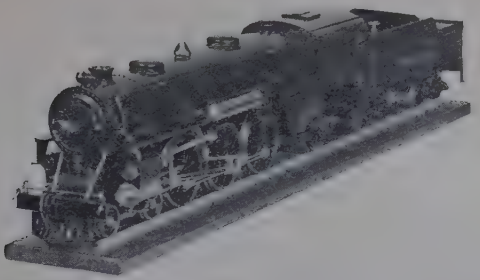

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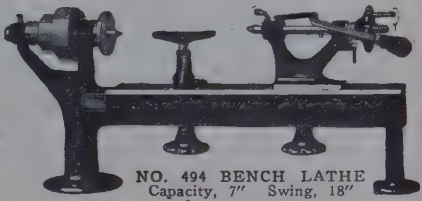

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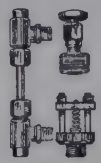

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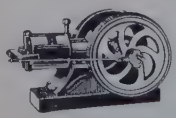

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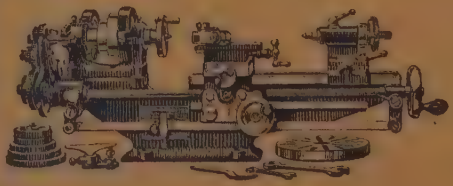

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